THE DOCK & HARBOUR AUTHORITY

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Editorial.

The Port of Stockholm.

Stockholm, the picturesque capital of Sweden, has been taken as the subject for this month's supplement.

This well-known port, which was first heard of in the thirteenth century, was even in those days ideally situated as a shipping centre for cargo boats, and also for the nearby hinterland. It first came into real prominence in the seventeenth century, since which date the port has been enlarged upon, though it was not until the nineteenth century that suitable quayage accommodation was constructed. From this date onwards things moved quickly, and from 1897 to 1928 vast developments were undertaken, which have made Stockholm the great port it is to-day.

Stockholm is situated on the east coast of Sweden and has a population of about 500,000, and, owing to its direct communication by water with Lake Malaren, transportation of goods from and to the hinterland is simplified.

The port of Stockholm is composed of sea harbours and inner harbours, and amongst the sea harbours the largest and most important is Stadsgardshamnen, and is used chiefly for exports and imports of general cargo, the tonnage using this harbour being about one-quarter of the total tonnage of all the vessels using the sea harbours.

The total length of quayage at the port of Stockholm is 16,827 metres, and 6,422 metres of this is spread over the harbours of Lake Mälaren and 10,405 on the sea harbours. Stockholm is well served with regard to craneage facilities, as in the port itself, and owned by the city, there are 101 cranes of various lifting capacities, and 5 more have been ordered and will be put into operation shortly. There are also another 20 cranes which are owned privately.

With regard to traffic, there has been a big increase in the number and tonnage of vessels which have arrived and departed from the port during the last three years, the figures for 1929 being: vessels arriving, 52,941, with a tonnage of 5,217,213; and departing, 53,034, and a tonnage of 5,234,164, a total of vessels arriving and departing of 105,975, and net registered tonnage of 10,451,377, an increase of over 4,000 vessels, and just over a million net registered tons on the figures for 1927.

The quantities of goods imported to the port of Stockholm showed a big increase in 1929 over 1928, the figures for 1929 being 3,800,000 tons, an increase of nearly 600,000 tons over 1928, and an increase of just over 1,600,000 on the figures of 1913.

Regarding exports, 1929 showed an increase over 1928 of 162,000 tons, with a total of 462,000 tons, and these figures alone show that the prosperity of Stockholm is a continuous one.

An illustrated article describing the port in full is given on another page, and we are indebted to Sal. Vinberg, General Manager of the Port of Stockholm, for his kind permission to reproduce same.

Australia's Idle Ports.

Mr. Richard D. Holt, ex-chairman of the Mersey Docks and Harbour Board, who has just returned from a world tour, giving his impressions, stated that one of the things that struck him were the enormous advantages which ports in Australia, New Zealand and Canada possessed over Liverpool in the matter of sheltered and deep waters, the opportunity of building wharves at which the largest ships could discharge, where tugs and even pilots, except to comply with local regulations, were unnecessary, and where there was not the great need there was in Liverpool of spending large sums in keeping the channels open. In spite of these great advantages, however, practically no business was being done at these ports, and it was a satisfaction to think that in our country, despite substantial difficulties, we were able to " keep up our end " so well. It gave him a certain amount of satisfaction also to find that there were people in or about the old Bidston Observatory connected with the Tidal Institute, who were earning a reasonable income by telling the people of Australia what their tides would be twelve months hence and even further ahead.

The Port of London Authority.

The 21st annual report of the Port of London Authority ending March 31st, 1930, has just been issued and shows that the port has had another very successful year.

The value of imports and exports for 1929 show that London handled over one-third of the total amount of the United Kingdom, and amongst the six principal ports of the United Kingdom the Port of London showed the biggest increase over the figures for 1928.

Buoyage and Lighting of Coasts.

The unification of buoyage and lighting of coasts is to form the subject of a special conference, convened by the League of Nations, at Lisbon, on October 6th, on the invitation of the Portuguese Government. International action has been necessitated by the constant development of navigation and the multiplication of the number and categories of signals which are now being used. The League's work in this direction may be regarded as the logical continuance of the attempts at unification made at the Washington Conference in 1889 and the St. Petersburgh Conference in 1912. Owing to the permanent machinery for international co-operation now established at Geneva, it has been possible to prepare much more thoroughly for the coming Conference at Lisbon than ever before. The League's Advisory and Technical Committee for Buoyage and Lighting of Coasts has had the assistance of experts from most of the countries concerned. Technical studies have been carried out in the Mediterranean, the Baltic, the United States of America and Canada. In the " General Report and Proposals " of the Technical Committee (Williams and Norgate, C. 59, M. 34, 1929, VIII.), which will come before the Conference, the main questions have been grouped in three parts dealing respectively with buoyage regulations, lighthouse signs and various coast and port signals, while additional sections contain recommendations on concordance between the characteristics of lighthouses and the associated fog signals, and wireless lighthouses. Coloured diagrams illustrate the proposals.

The Port of Belgrade.

A conference under the Presidency of M. Lazar Radivojevic was held on the 31st July at the Ministry of Communications to consider the building of the Port of Belgrade. Representatives of the Ministry of Public Works, Ministry of Communications, and the Municipality of Belgrade were present.

M. Radivojevic pointed out the necessity for the building of the Port of Belgrade, partly in view of the increase of river traffic and also in order to improve the capital.

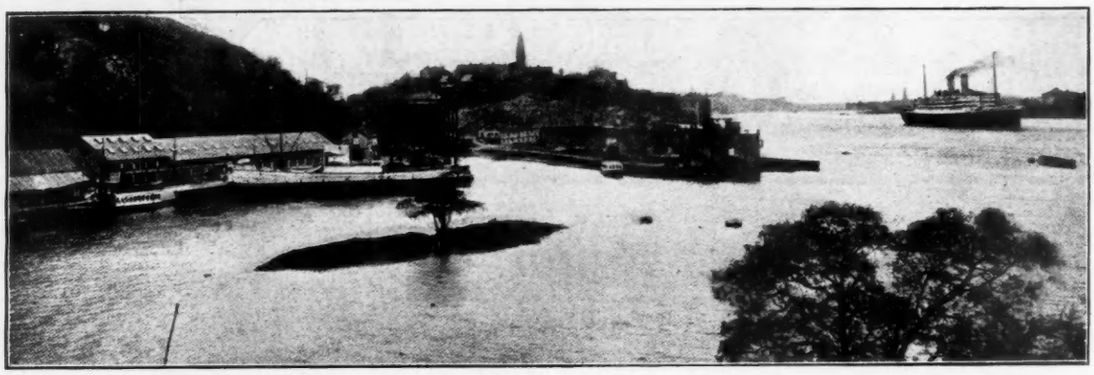
The Director of the Department for Maritime and River Navigation submitted a report dealing with the traffic question in the Port of Belgrade, the plans already prepared, and the materials necessary for the building of the new port.

It was agreed that building should be commenced as soon as possible on the part of the Save bank, for which detailed plans and building materials already exist. The work would then be extended along the banks of the Save and Danube.

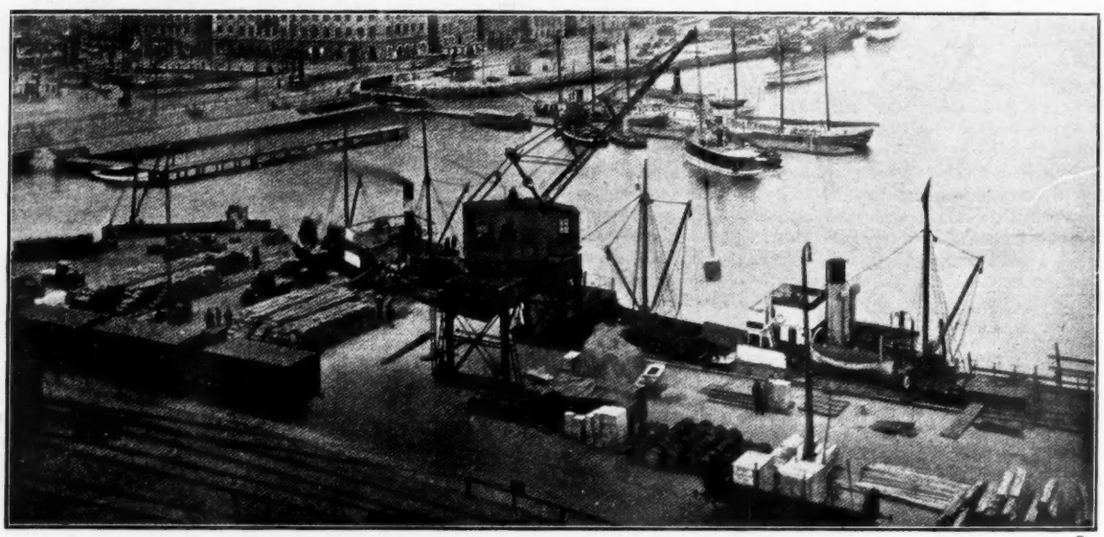
The first part of the work will cover a length of about 1 kilometre and will cost approximately 60 million dinars. As both the State and the town of Belgrade are equally interested in the work, it has been agreed that the State shall bear two-thirds of the expense and the Municipality one third.

The plans have been prepared with the possibility in view of the Belgrade-Pancevo Railway lines passing along the quay-

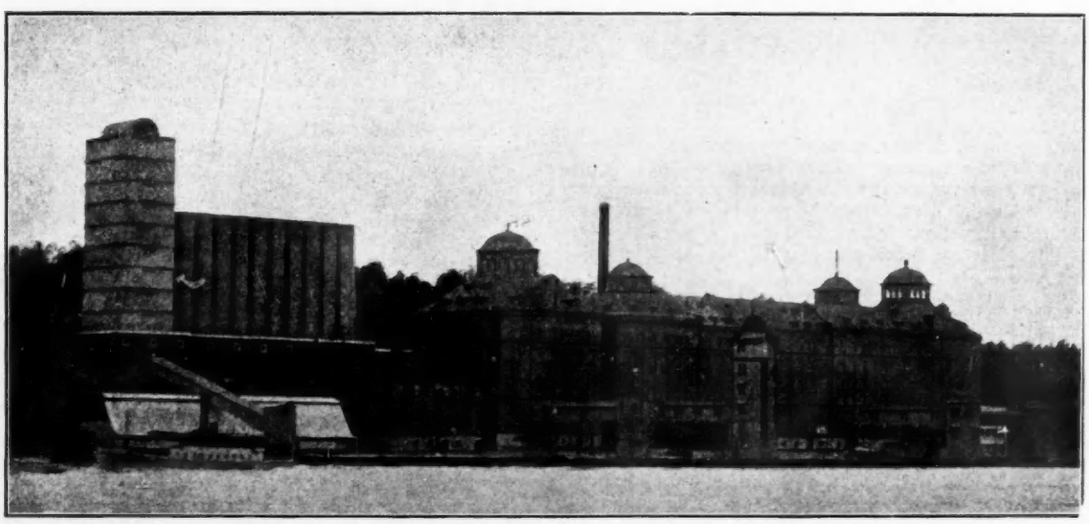
Port of Stockholm.



The Inlet to the Port of Stockholm from the Sea, showing Finnboda Varv.



The Inner Part of Stadsgardshamnen and Skeppsbron.



The "Tre Kronor" Mill, owned by the Co-operative Association, at the Inlet to Stockholm from the Sea, with the largest Grain Silo in Sweden.

The Port of Stockholm.

View over the Inner Waters of the Sea Harbours.

Historical.

THE Port of Stockholm may be said to be as old as the town itself. Established on an islet just where Lake Mälaren flows into the Baltic, and consequently surrounded by extensive navigable waters, the town was from the very beginning dependent on sea traffic, and it was natural that through it should pass the trade between the early inhabited regions round Lake Mälaren and the coastal districts. From the middle of the 13th century, when Stockholm is first mentioned as a town, and throughout the Middle Ages, the trade and sea traffic of Stockholm were, however, in the hands of foreigners, especially the Hanse towns of Lübeck and Danzig, until Gustaf Vasa liberated the country from foreign dependence in 1534 and made it possible for the Swedes to conduct themselves their shipping and trade with foreign countries. During the 17th century Stockholm developed into an important trade and shipping centre, thanks to the King's vigorous measures. Charles IX. decided that the town should be the chief harbour of the Baltic, and Gustavus II. Adolph revived the ancient regulation that all goods from the towns north of Stockholm should be carried there to be sold and shipped. Since then, under the influence of various foreign nations, Stockholm has made steady progress as a seaport. It is, however, mainly during the present century, in the course of which Sweden established a number of shipping lines to European as well as trans-oceanic ports, that the sea traffic to Stockholm has attained considerable proportions and the port of Stockholm has developed into one of the largest and busiest ports on the Baltic. The first harbour erection in Stockholm, a wharf on the southern part of the present Skeppsbron, Fiskastrand, was built towards the end of the Middle Ages. A long time elapsed, however, before further constructions were undertaken, and during the next few centuries these consisted of simple jetties. It was not until the 19th century that proper quays were built, such as the quays at Skeppsbron, Blasieholmen, Nybroviken, and Strandvägen. A new epoch in the development of the harbour begins with the construction of the connecting railway between the Central Station and the Södra (South Side) Station in the years 1865-1872. In 1875-1882 a quay of 530 metres in length was built on the inner part of Stadsgardshamnen, which was connected up with the above-mentioned railway. In 1879 the construction of Värtahamnen for coal and bulk goods was commenced on the central and southern part, which was completed in 1886 and connected at Tomteboda with the northern trunk line of the State Railways by means of a siding of 6 km. in length, Värtabanan. These works having been completed, nothing further was done in the way of harbour construction until the middle of the 'nineties. Then a new period of extensive building activities commenced, comprising the extension and completion of Stadsgardshamnen in 1897-1916, the extension to the north of Värtahamnen and its completion in 1903-1912, the extension of the harbours in Lake Mälaren in 1892-1901, and finally the construction of the Free Port in 1917-1926 and of Hammarbyhamnen in 1917-1928.

Position.

Stockholm, the capital of Sweden, with a population of some 473,000, is situated on the east coast of Sweden, on the large inland sea that comprises the Baltic and its arms, the Gulf of Bothnia, and the Gulf of Finland, at the spot where Lake Mälaren sheds its water into the Baltic, locally called " Saltsjön " (the sea). The city is situated within an archipelago that extends from East to West for about 50 kilometres and from North to South for about 120 kilometres, and is built partly on several islands and islets, partly on the shores of Lake Mälaren and the sea. Between the different parts of the city there are a number of navigable channels, viz., in Lake Mälaren: Riddarfjärden, Arstaviken, Liljeholmsviken, Essingesunden, Klara sjö, Barnhusviken, Karlbergssjön, and Ulvsundasjön; and in the sea: Stora and Lilla Norrström, " Strömmen," Nybroviken, Ladugardslandsviken, Djurgardsbrunnsviken, Lilla Värtan, Hammarby sjö, and Norra Brunnsviken.

Approaches to the Port and Connections between the Sea and Lake Malaren.

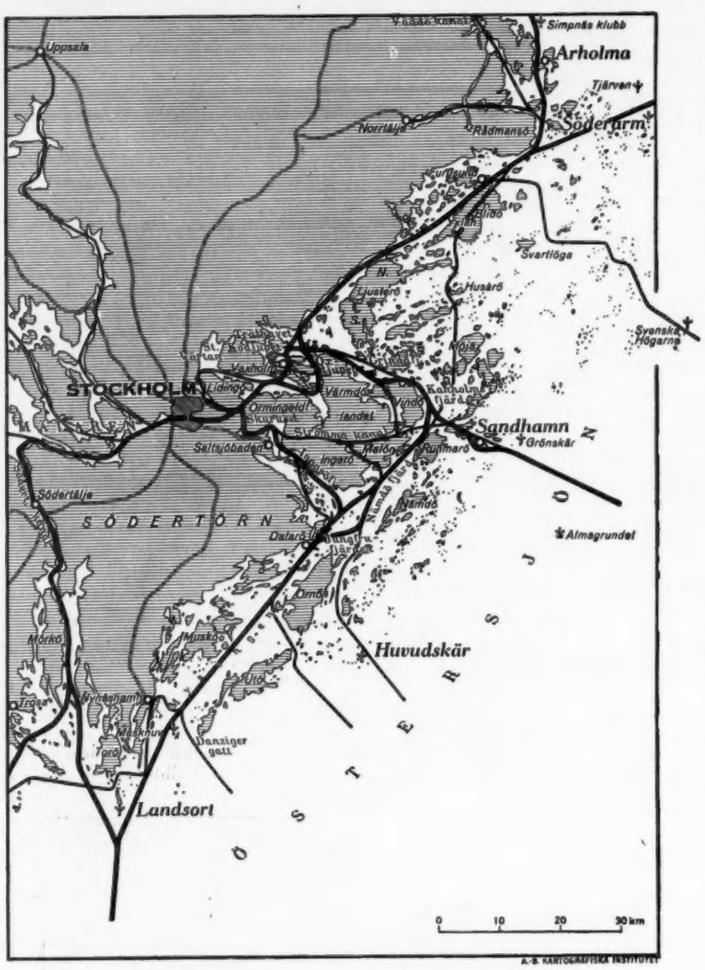
There are four main approaches to Stockholm from the sea: one from the North passing Arholma or Söderarm (navigable depth 8 m.) through Furusundsgattet, Trälhavet, Kodjupet (navigable depth 3.4 m.) or Oxdjupet (navigable depth 11.5 m.); one from the East passing Sandhamn through Kanholms- and Grindafjärdarna to Trälhavet; and two from the South, one passing Landsort or Huvudskär with one route northward via Jungfru- and Nämdöfjärdarna to Kanholmsfärden, and another to the North-West through Ingarö- and Baggensfjärdarna, Baggensstäket (navigable depth 2.5 m.) and Skurusundet; and one through the Södertälje Canal and Lake Mälaren (navigable depth 6 m.).*

At Stockholm Lake Mälaren has navigable access to the sea through three channels: Norrström, its branches Stora and Lilla Norrström being navigable for tugboats, lighters and pleasure boats; the lock at Karl Johans torg, which has a length from gate to gate of 45.12 metres (by using caissons 69.45 m.), a width at the gates of 9.5 m., and a minimum depth of 3.5 m.; and finally Hammarbyleden, a new fairway south of the inner planned part of Stockholm, with a length of 5,560 m., a minimum width (in Danvik Canal) of 35 m., a depth at low water of 6.25 m. (at mean water 6.55 m.), and a lock at Skanstull, Hammarbyslussen, with an average length from gate to gate of 115 m., a width of 17.4 m. and a depth at low water of 6.25 m. Since May 1st, 1926, Hammarbyleden has been provisionally open to vessels drawing not more than 3.5 m. (determined by the depth at the railway bridge at Liljeholmen), but this was

*Branching out from these main channels, there are several minor ones, the more important of which are indicated on the map on page 327.

The Port of Stockholm—continued.

completed in June, 1930, as also was the railway bridge over the Arsta islets and the obstacle to sea traffic presented by the railway bank and bridge at Liljeholmen is now removed. Hammarby sjö, Arstaviken, and Liljeholmsviken are already of full depth, though in the case of Arstaviken only in the part south of the Arsta islets. The depth at low water in the part north of the isles is only 4 m. and will not be greater until the Arsta bridge is completed.



Channels giving access to the Port of Stockholm.

The following bridges cross the above-mentioned channels :—

	Free height above m.w.l.
Over Stora Norrström :	
Norrbro, a fixed road bridge ...	with 5.5 metres
Riksbron, a fixed foot bridge ...	with 3.2 metres
Over Lilla Norrström :	
Norrbro, a fixed road bridge ...	with 5.1 metres
Stallkanalsbron, a fixed road bridge	with 4.2 metres
Over Lake Mälaren above Norrström :	
Vasabron, a fixed road bridge ...	with 3.2 metres
The Railway Bridge with a turning bridge	*with 2.7 metres
Over the lock at Karl Johans Torg :	
Ostra slussbroarna, 3 road draw bridges	*with 2.9 metres
Västra slussbroarna, 2 road draw bridges	*with 2.9 metres
Over Lake Mälaren nearby the lock :	
The Railway Bridge, fixed part ...	with 2.9 metres
The Railway Bridge, turning part ...	*with 2.3 metres
Over Hammarbyleden :	
Danviksbro, a road draw bridge ...	*with 12.5 metres
Skansbro, a road draw bridge ...	*with 12.5 metres
Arstabron, a railroad bridge across the southern fairway, a fixed bridge	with 26.0 metres
across the northern fairway, a lift bridge	with 32.0 (21.4*) metres
Liljeholmsbron, a road bridge, fixed part	with 15.5 metres
draw bridge	with 14.5 metres

*when closed.

Communications by Water with the Interior.

The port of Stockholm has water communication with the country round Lake Mälaren and the extensive inland districts around the other large lakes of Central Sweden.

Lake Mälaren, the third largest lake in Sweden, has a length of about 130 km. and is everywhere navigable for vessels drawing up to 6 m. On the shores of the lake and its affluents there are a number of towns and other communities, as well as a great many industrial establishments of various kinds. Beyond Lake Mälaren access is given to districts still further inland by means of three canals, northwards by the Strömsholm Canal, 107 km. in length, to Smedjebacken (navigable depth 1.35 m.), southwards by the Hjälmare Canal between the Arboga River and Lake Hjälmaren, 13.7 km. in length (navigable depth 1.9 m.), and by the Eskilstuna Lower Canal, 1.7 km. in length, to Torshälla (navigable depth 2.3 m.), continued by the Eskilstuna River to Eskilstuna.

Communication is made with the other large lakes of Central Sweden—Lakes Roxen, Boren, Vätern and Vänern—by the Göta Canal, which has a length of 190 km. (navigable depth 2.8 m.), the continuation of which on the farther side of Lake Vänern, the Trollhätte Canal (navigable depth 4.4 m.), runs to Göteborg and the North Sea.

Railway Connections.

The following railways connect Stockholm with the interior :—

Northwards.

(1) The northern trunk line of the State Railways, via Uppsala, Krylbo, Storvik, etc., to upper Norrland. At Uppsala, 66 kilometres north of Stockholm, this line is connected with the private railway Uppsala—Gefle, and by this railway with the recently completed likewise private—Ostkustbanan (the East Coast Railway). At Krylbo, 95 km. north-west of Uppsala, the line meets the private Södra Dalarne Railway, which runs through the heart of the province of Dalarna. (2) The private Stockholm-Västeras—Bergslagen Railways (" Västerasbanan "), which at Tillberga—101 km. north-west of Stockholm—divides in two branches, one to the South-West via Västeras to Köping, with connections, among other places, with Arboga, Frövi, and Orebro, the other to the North-West to Ludvika and Vansbro, both lines having several sub-branches to different parts of Central Sweden. (3) The private Stockholm-Roslagen Railways (" Rimbobanan "), with branch lines to the eastern districts of the province of Uppland.

Southwards.

The western trunk line of the State Railways, joining the private Stockholm-Nynäshamn Railway (" Nynäsbanan ") at Alvsjö, 8 km. south of Stockholm, and connecting at Södertälje, 37 km. south-west of Stockholm, with the Norra Södermanland Railway, running in a westerly direction; from Järna, 11 km. south of Södertälje, the line runs in two branches, one to the West via Katrineholm to the western and central parts of Sweden, the other to the South-West, via Nyköping and Norrköping, to the South of Sweden, both of them having a number of secondary branch lines. (2) The private suburban Stockholm-Saltsjön Railway (" Saltsjöbanan ") to Saltsjöbaden.

Traffic Area and Traffic Conditions.

Being the largest city in and the capital of Sweden—its population numbering nearly half a million—and furthermore receiving every year a great number of visitors, Stockholm is an important centre of consumption. The volume of commodities required to meet the needs of the city itself is alone sufficient to give rise to a considerable amount of traffic in the port.

Another advantage of Stockholm as a port is the fact that the city is the largest industrial centre in the country and is surrounded by a number of suburbs with industrial establishments of different kinds. Within the administrative boundaries of the city alone there are more than 1,000 industrial establishments, employing over 40,000 workers, apart from the building industry with about 20,000 workers, handicraft and minor industries. The value of the annual production of the industries in Stockholm is estimated at about 500 million kronor.

The territory Stockholm serves, however, extends far beyond the areas just mentioned. Situated at the outlet of Lake Mälaren into the sea, Stockholm is the natural trading centre of the country round that lake and, by means of the waterways connecting it with the lake and of its railway communications, serves the greater part of Central Sweden, including a great number of towns and other communities, extensive agricultural districts, the majority of the industries of the country, involving activities within the various spheres of economic life: agriculture, forestry, mining, iron manufactures, etc. Moreover,

STOCKHOLM HARBOUR.

UNDER THE JURISDICTION OF THE STOCKHOLM HARBOUR BOARD.

Scale for Sections.

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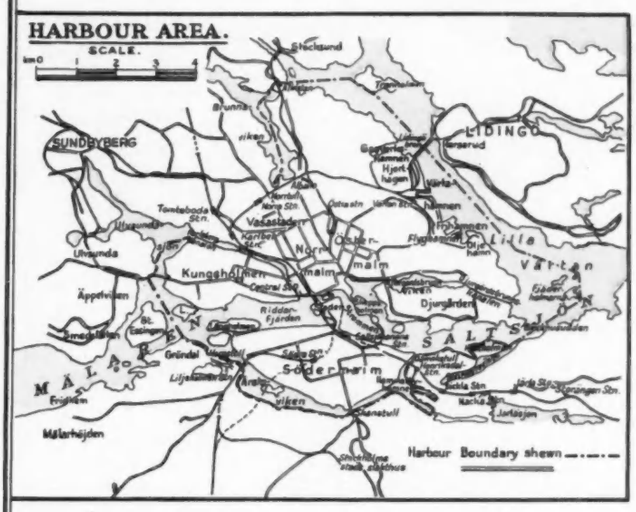
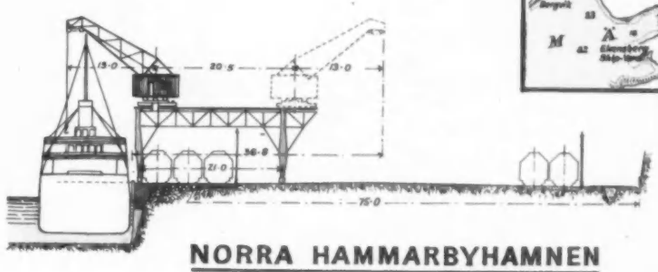
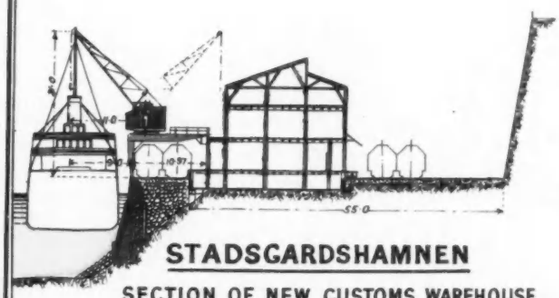
1 METRE = 3·28 FEET





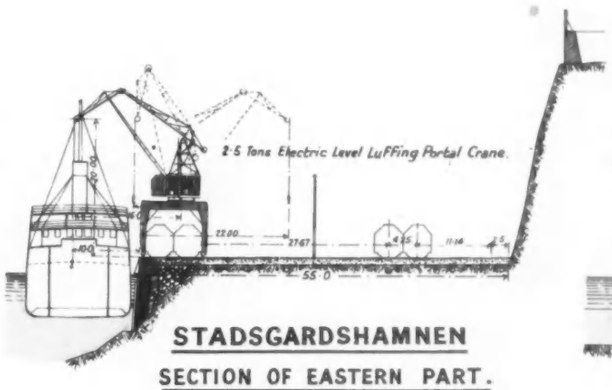
NORRA HAMMARBYHAMNEN

SECTION OF BARNÄNGSKAJEN.



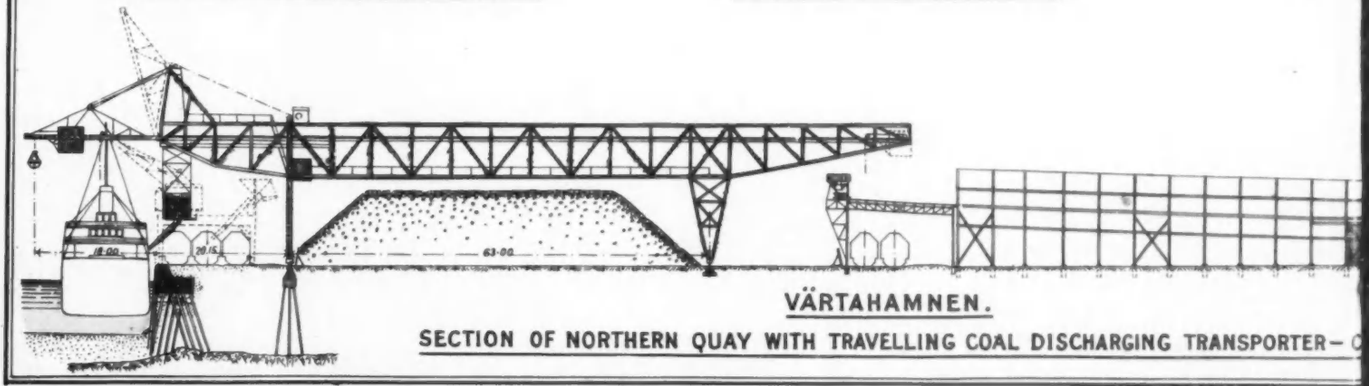
STADSGARDSHAMNEN

SECTION OF NEW CUSTOMS WAREHOUSE



STADSGARDSHAMNEN

SECTION OF EASTERN PART.



VÄRTAHAMNEN.

SECTION OF NORTHERN QUAY WITH TRAVELLING COAL DISCHARGING TRANSPORTER—C

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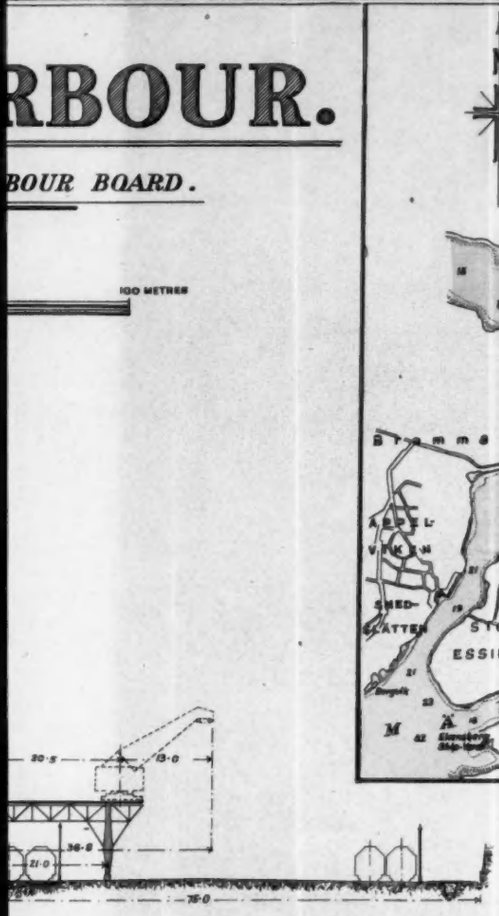

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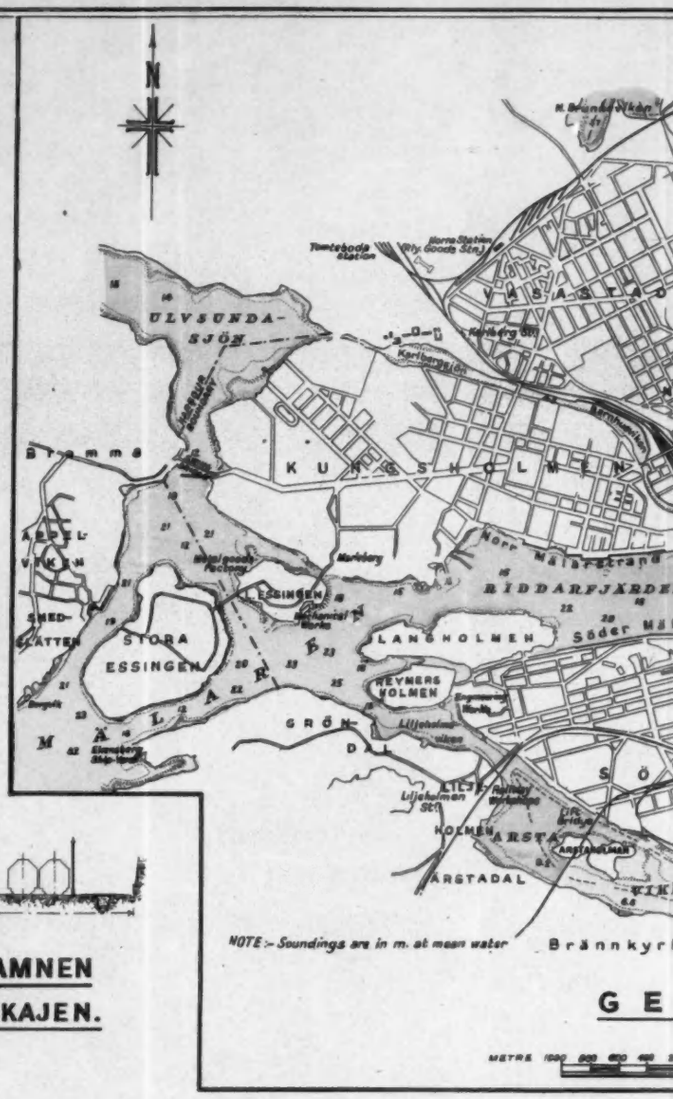
SECTION OF BARNÄNGSKAJEN.



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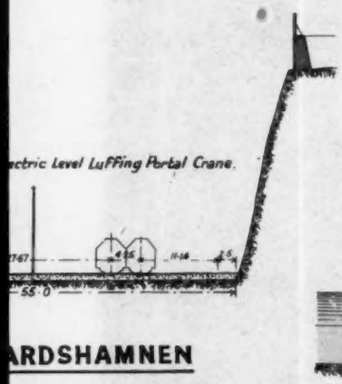

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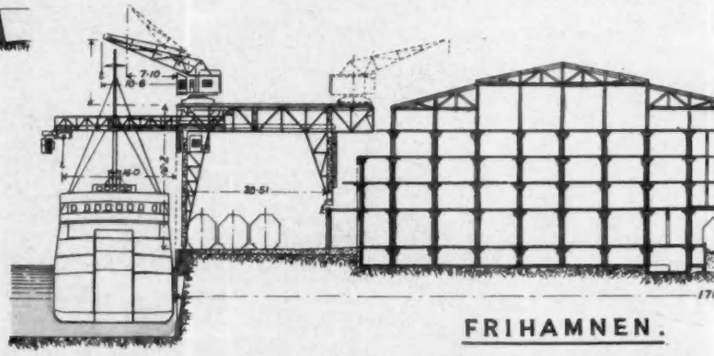

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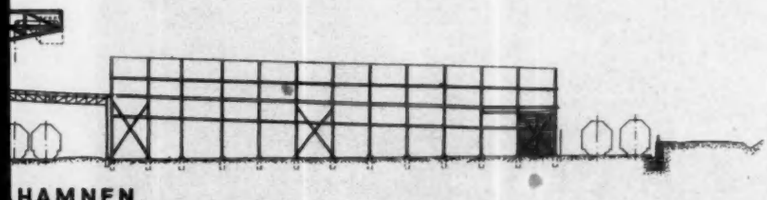

HAMNEN.
AVELLING COAL DISCHARGING TRANSPORTER-CRANE.

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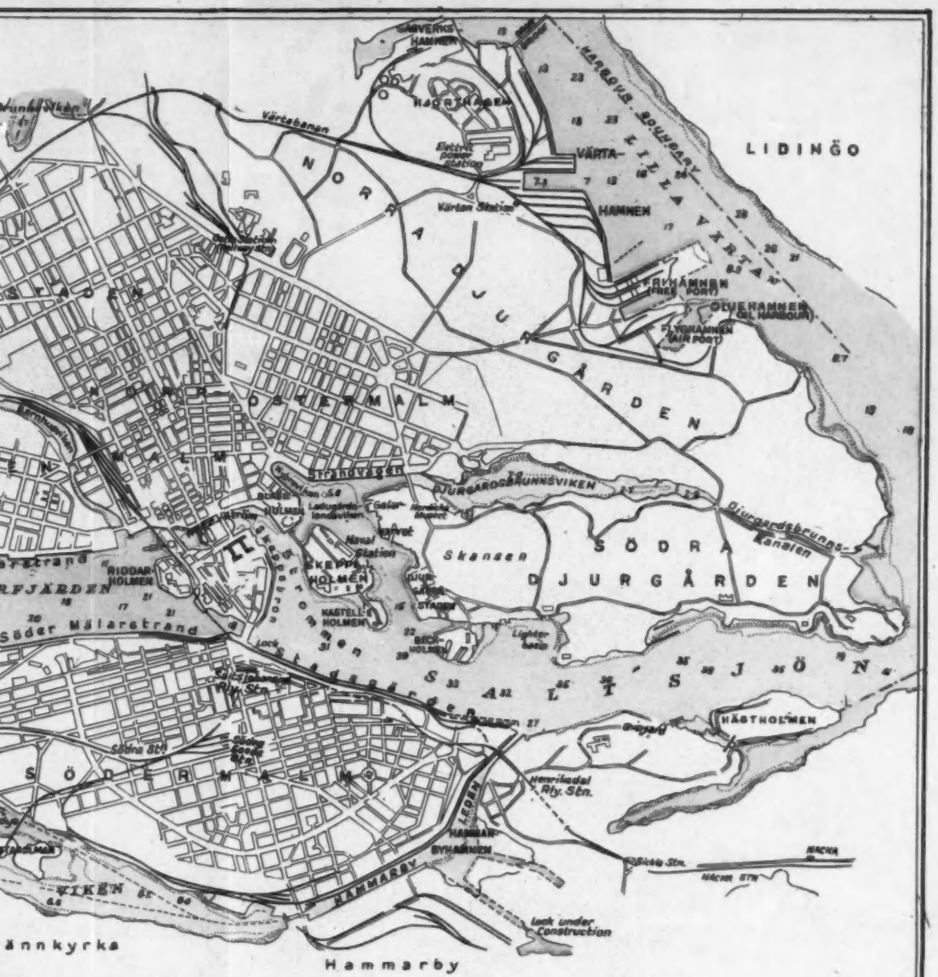
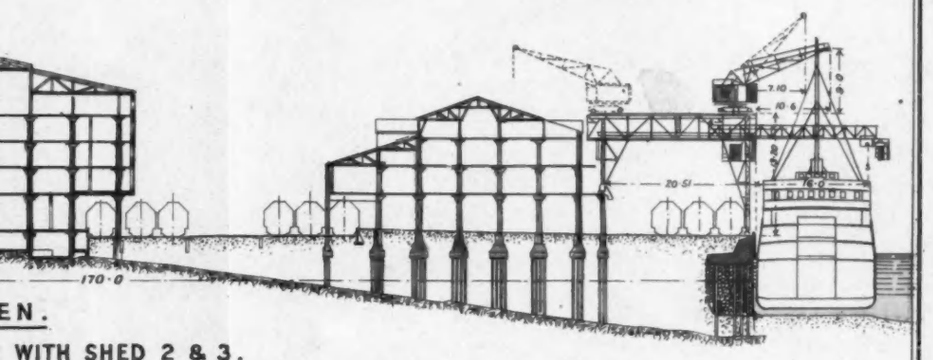


GENERAL PLAN.

Scale of Metres.



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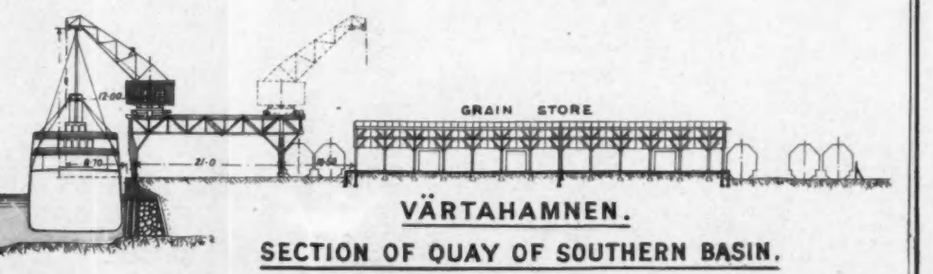
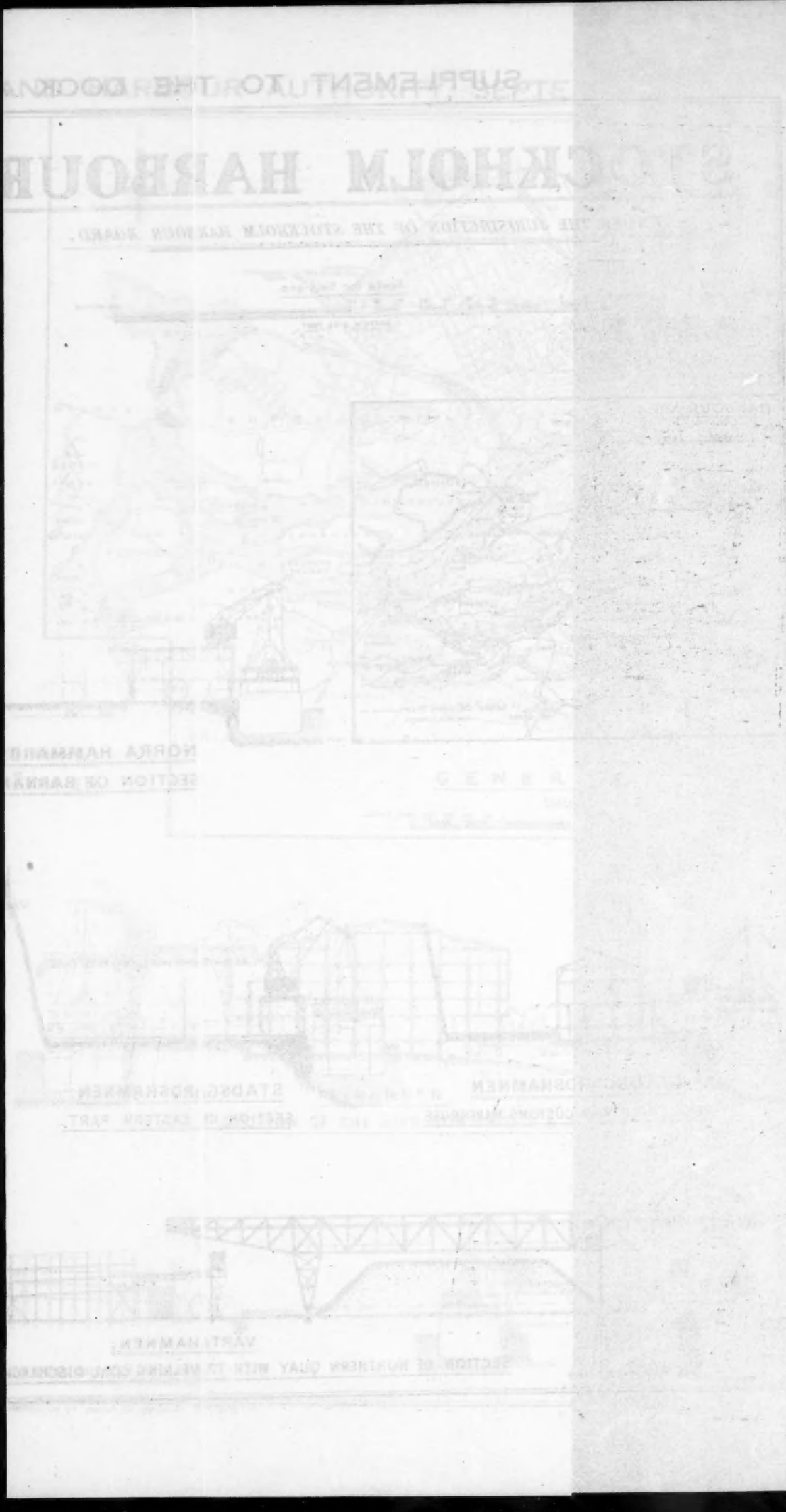


VÄRTAHAMNEN.

SECTION OF QUAY OF SOUTHERN BASIN.



The Port of Stockholm—continued.

especially in winter time when the Gulf of Bothnia is ice-bound, Stockholm constitutes the entrepôt for the imports to and the exports from a great part of Northern Sweden and Finland.

Finally, the direct overseas connections between Stockholm and various parts of the world makes it the natural entrepôt for the transit traffic with the countries across the Baltic.

Two 5-tons Level-luffing Jib Cranes at Eastern Stadsgardshamnen.

Port Administration.

The port of Stockholm, which with the exception of a certain proportion of the railways and apart from a small contribution from the State to the Värtahamnen, was built and is owned by the city of Stockholm, comprises two main parts, the Customs Harbour and the Free Port.

Since January 1st, 1909, the Customs Harbour has been administered by the Harbour Board, which consists of a chairman, chosen from amongst the burgher councillors (" borgarraden ") by the City Board (" stadskollegiet "), and six other members, one of whom is appointed by the Government, another by the Stockholm Chamber of Commerce and four by the City Council. The Board is assisted by a general manager. Under him the administration is divided into three departments, the Harbour Office, with the harbour master at the head for the executive work; the Harbour Building Department, under the direction of the chief engineer, for constructional and maintenance work, and the Audit Department, under the charge of the harbour treasurer, for the book-keeping and accounts, as well as questions pertaining to tariffs, customs and real property. The Harbour Board is charged with not only the administration of the port but also with the administration and maintenance of the bridges over the waterways.

As far as the buildings and constructions are concerned, the Free Port is administered by the Harbour Board, but is managed on behalf of the city of Stockholm by a joint stock company, the Stockholms frihamnsaktiebolag, with a capital of 500,000 kronor, 499,500 kronor of which is subscribed by the city. The Board of this company consists of seven members, two of whom are chosen at the annual meeting of the shareholders and four, of whom at least two must be members of the Harbour Board, by the City Council. The chairman of the Harbour Board is *ipso facto* a member of the board of directors of the company, and the general manager of the board of directors of the company, and the general manager of the port is entitled to be present at the meetings of the board and to take part in its deliberations. In the management of the Free Port the board is assisted by a director. The present agreement with the Free Port Company made on behalf of the city by the Harbour Board covers the period from January 1st, 1925, until January 1st, 1935.

Harbour Area and Harbour Works.

The Stockholm harbour area, by which is understood the area of water with harbour facilities which constitutes the port of Stockholm, including the Free Port, and to which the tariffs and regulations of the port apply, is shown on the Supplement. The harbour area surrounds the city on all sides. It has a water area of about 1,500 hectares and extends about 10 kilometres from East to West.

The harbour works are situated on Lake Mälaren as well as on the sea, and on several places in the centre of the city as well as in the outskirts.

The Mälaren harbours are chiefly situated on Riddarfjärden, Klara sjö, Barnhusviken, and Liljeholmsviken. They are: Kornhamnstorg, Mälartorget, Munkbrohamnen, Riddarholmshamnen, Tegelbacken, Klara Mälarstrand, Norr Mälarstrand, Ralambshovshamnen, Söder Mälarstrand with Sjöbergs Plan, Kungsholms Strand, Klara Strand, Barnhusstranden, Tranebergskajen, and Liljeholmskajen, together with some smaller quays for goods traffic.

The Mälaren harbours are principally used for passenger and food traffic along the inland waterways of Central Sweden and the southern parts of the east coast, etc., for reloading export goods such as engines, iron manufactures, etc., and as local harbours for the import of building materials, firewood, coal, etc.

Since the reconstruction and deepening of the Södertälje Canal vessels drawing nearly 6 metres have been able to enter Lake Mälaren, and the route through the canal effects a saving of 2 to 2½ hours as compared with the sea route.

The sea harbours are situated partly on the inner basins, " Strömmen," Nybroviken and Ladugardslandsviken, partly on the outer ones, Lilla Värtan and Hammarby sjö.

The inner sea harbours are: Stadsgardshamnen, Skeppsbron, Södra Blasieholmshamnen, Norra Blasieholmshamnen, Nybrohamnen, and Strandvägen. The outer ones are: Värtahamnen, the Free Port, the oil harbour at Loudden (Oljehamnen), and the gas works harbour (Gasverkshamnen) at Lilla Värtan, Norra and Södra Hammarbyhamnarna, and Henriksdalshamnen on Hammarby sjö. In addition there are a number of small landing stages in different parts of the city.

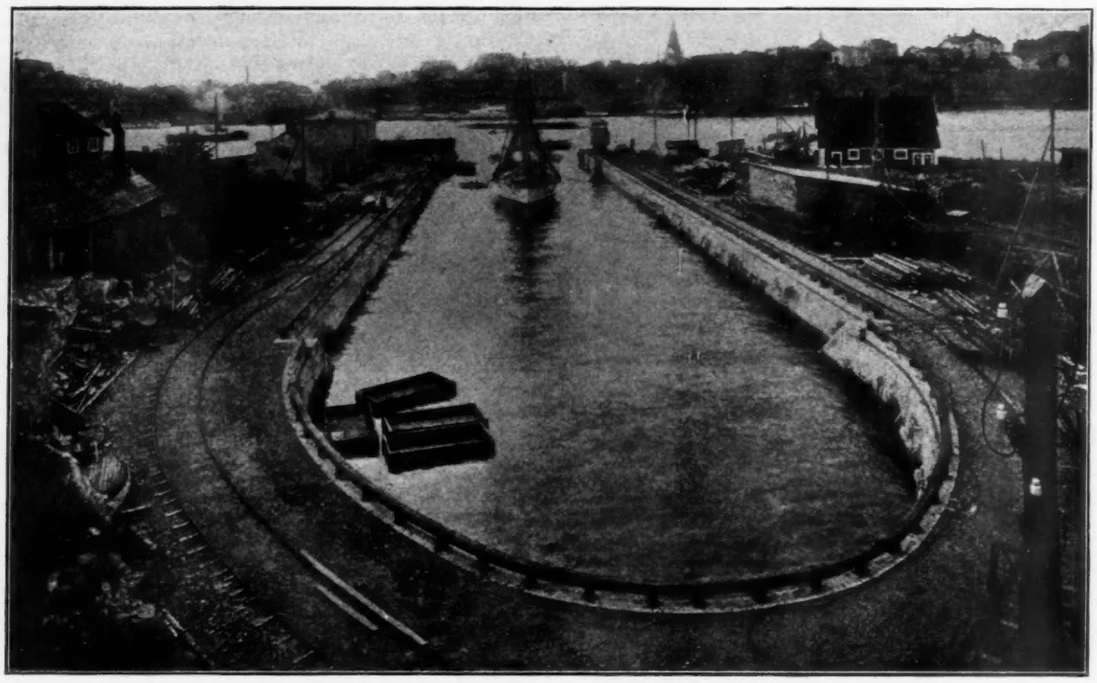
Stadsgardshamnen is the largest and most important harbour of Stockholm for exports and imports of general cargo. It is used by the vessels of the German (Stettin, Lübeck, Hamburg, Bremen), English, Dutch, Belgian, French, Mediterranean, North American and Australian lines, and the tonnage of vessels calling at this harbour is not less than a quarter of the total tonnage of all the vessels making the sea harbours. The harbour is well equipped.* There are five buildings containing

Five-tons Level-luffing Jib Crane at Western Stadsgardshamnen.

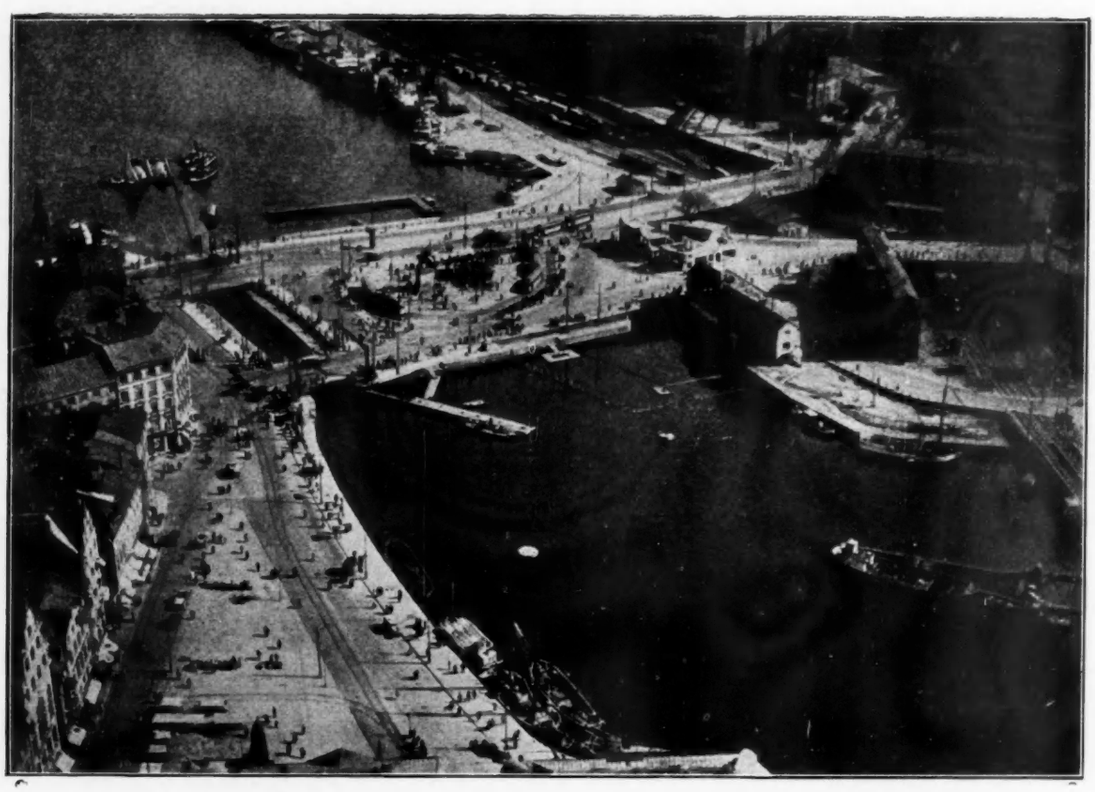
warehouses and customs offices. The so-called warehouse building in the inner part of the harbour is built of stone in seven storeys, the five upper floors being rented by a storage company for the storing of goods. Skeppsbrohamnen is used for the Norrland, the Finnish, and the Baltic traffic, as well as for the

*For length of quays, depth, and crane equipment of the harbours, see Tables 1 and 2 on page 330.

Port of Stockholm.



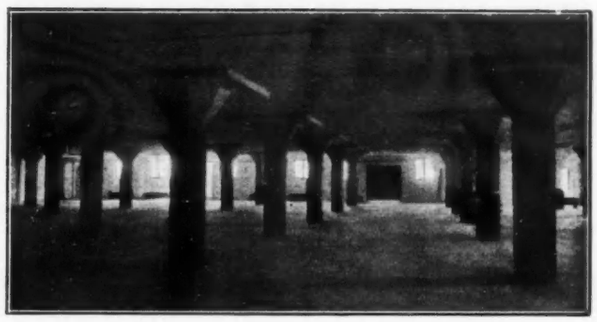
Gustav V. Dock on Beckholmen.



The Inner Part of Riddarfjarden, with Kornhamnstorg, the Lock at Karl Johans Torg and Sjobergs Plan.

The Port of Stockholm—continued.

traffic with the Stockholm archipelago. The wharf has been widened during last few years and is in the immediate future to be equipped with cranes. Södra Blasieholmshamnen is used exclusively for the local archipelago traffic and Norra Blasieholmshamnen for traffic with Southern and Western Sweden, Denmark, and Norway. Nybrohamnen is used for traffic with the islands in the archipelago and for small cargoes to and from inland places, and Strandvägen as a local harbour for the discharge of sand, stone, firewood and bricks. Värtahamnen is the largest harbour in Stockholm for goods in bulk. Via this harbour are imported coal, grain, fertilisers, foodstuffs, oils, herrings, salt, iron, etc., and such goods as ore, lumber, pulp, iron, etc., are exported from same. The space adjacent to the quays is used for general traffic, while the rest is leased for storing purposes or for industrial uses. There is in the harbour a special administration building, containing a harbour office, premises for the Customs preventive officers, and a fire and police station. The Free Port is a harbour for general cargoes, especially overseas imports. It is very well equipped with spacious modern warehouses and sheds for the storage of goods. In one of these warehouses are situated the offices of the Free Port Company. Within the port are also offices for the



The Free Port: One of the Upper Floors of Warehouse III.

Customs administration, post and railway offices, as well as a restaurant and some private warehouses. The oil harbour at Loudden (Oljehamnen) is the new harbour for the import of combustible oils. It is connected by a track with the railway system of the Free Port. The area is divided into plots, which are leased by the importers and used for tanks, pump houses, etc., while landing stages and other arrangements for common use are maintained by the city. The gas works harbour (Gasverkshamnen) is used for importing coal and coke for the city gas works and for exporting the by-products produced. Norra Hammarbyhamnen is a new harbour on Hammarbyleden. Its eastern part is chiefly used for heavy cargoes, the centre for goods in bulk and for storing imported coal, coke, cement, herrings, salt, etc., and the inner part for unloading of firewood, bricks, etc., from places in the vicinity of the city. The harbour is connected with the rail system of Stadsgardshamnen by means of a tunnel below " Fafängan," but is later on to be connected with " Södra Stationen " by a special railway. The harbour has a very modern equipment, and further improvements are planned. Södra Hammarbyhamnen is a new industrial harbour on Hammarbyleden. The General Motors Corporation has bought an extensive plot on this harbour and erected works for the construction of automobiles. Henriksdalshamnen is a small harbour for industrial use and storage, the main part of which has been leased for such purposes.

The length of and depth of water at the quays are shown in the following table:—

TABLE 1.

Length and Depth of Water of the General Quays of the City.

	Length of quay. Metres	Depth at mean water within 4 m. from quay. Metres
ON LAKE MALAREN.		
Korshamnstorg	326	3.5—4.7
Mälartorget		
Munkbrohamnen	174	7.5
Riddarholmshamnen	572	3.1—4.7
Tegelbacken	114	1.9—3.0
Klara Mälarstrand	207	3.75—4.25
Norr Mälarstrand	967	3.4—5.7
Ralambshovshamnen	107	3.1—3.6
Söder Mälarstrand	1,618	4.4—6.0
Sjöbergs plan	67	4.0
Kungsholms strand	423	2.7—4.3
Klara strand	302	2.2—3.2
Barnhusstranden	774	2.9—3.5
Traneberg-kajen	101	3.7—4.3
Liljeholmskajen	201	4.0
Small Loading-stages (Arsta strand, etc.)	469	2.5—4.0
Total length of quayage on Lake Mälaren	6,422	
ON THE SEA.		
Stadsgardshamnen	1,394	6.0—8.5
	67	3.4
Skeppsbron	851	3.0—6.4
Södra Blasieholmshamnen	417	3.7—4.4
Norra Blasieholmshamnen	379	5.1—5.7
Nybrohamnen	281	3.3—4.4
Strandvägen	841	4.1—4.4
Värtahamnen	2,572	6.0—8.2
Frihamnen (the Free Port)	1,218	7.9—9.9
Oljehamnen vid Loudden (the oil harbour), stages	—	5.5—9.0
Gasverkshamnen (the gas works harbour)	420	4.5—8.0
Norra Hammarbyhamnen	1,445	6.55
	250	3.4
Södra Hammarbyhamnen	207	6.55
Henriksdalsbryggan	30	3.9
Small loading stages	33	2.7
Total length of quayage on the Sea	10,405	
Grand Total	16,827	

To this length may be added landing stages of a length of 2,755 m. for pleasure boats.

The land area of the port is about 143.7 hectares, the length of railway tracks 45,509 m., of crane tracks 5,834 m., and the total floor space of the various sheds, warehouses, and Customs buildings of the port is 83,930 square metres.

There are in the port 98 cranes owned by the city and 20 cranes belonging to the State Railways or to private owners. The positions and types of the cranes are shown below:—

TABLE 11.

Cranes in the Port of Stockholm, Owned by the City.

	No.	Type.	Lifting Capacity. Tons.	Distance of reach outside quay. m.
Norr Mälarstrand	3	Slewing Cranes ...	2.5—5	8.5—8.8
Söder Mälarstrand ...	2	,, ,, ...	3—3.5	7.6
Kungsholms strand ...	1	,, Crane ...	2.5	8.6
,, ,, ...	1	Hand-driven Crane	5	5.7
Barnhusstranden ...	1	Slewing Crane ...	2.5—5	8.7
Arsta strand	1	,, ,, ...	3	9.5
Stadsgardshamnen, eastern	1	Gantry Crane (stationary) ...	20	8
,, ,,	8	Gantry Cranes ...	2.5—5	8.9—12.4
,, central	10	,, ,, ...	2.5—5	8.9—9.8
,, ,,	1	Slewing Crane ...	3.5	—
,, western	4	Gantry Cranes ...	2.5—5	8—8.5
Norra Blasieholmshamnen	1	Hand-driven Crane (stationary) ...	10	4.7
Strandvägen ...	2	Slewing Cranes ...	2.5—5	8.9
Värtahamnen, northern ...	4	Gantry Cranes ...	5	8.2
,, southern basinquay ...	2	,, ,, ...	2.5	8.2
Värtahamnen, southern basinquay ...	5	Bridge Cranes ...	3—5	8.5—8.7
Värtahamnen, southern ...	6	Gantry Cranes ...	5	7.9—8.8
,, ,, ...	1	Bridge Crane ...	6.5	12.5
,, ,, ...	2	,, ,, ...	10	9.7
Frihamnen (The Free Port)	4	Gantry Cranes ...	2—2.5	8.4
,, ,, ,, ...	8	Bridge ,, ...	1.5—5	9.5
,, ,, ,, ...	8	Double br. Cranes ...	3 (1.5)	10.6 (16)
,, ,, ,, ...	1	Slewing Crane ...	3	—
Gasverkshamnen ...	2	Gantry Cranes ...	7.5	11.0
,, ...	2	,, ,, ...	4.5	7.4
,, ...	4	,, ,, ...	1.2	6.9
,, ...	1	Slewing Crane ...	1.5	7.0
Norra Hammarbyhamnen	8	Bridge Cranes ...	5	9.7
Skeppsbron ...	1	Gantry Crane ...	5	8.6
Pontoon-cranes ...	1		60	
	1		15	
	2		6	
	2		4	
Total number	101			

In addition the following cranes have been ordered by the city to be delivered at the beginning of 1930:—

	No.	Type.	Lifting Capacity. Tons.	Distance of reach outside quay. m.
Värtahamnen, southern basinquay	2	Bridge Cranes ...	5	8.7
Norra Hammarbyhamnen ...	3	,, ,, ...	5—6	9.7
Not owned by the City,				
Värtahamnen, northern ...	1	Slewing Crane ...	2.5	—
,, ,, ...	4	,, Cranes ...	1.5	—
,, ,, ...	2	Bridge Cranes ...	6	18.0
,, northern basinquay	2	,, ,, ...	5	12.2
,, ,, ,,	2	Gantry Cranes ...	5.2	8.7
Pontoon-Cranes	2		6	
	1		4	
	5		1.5—3.5	
	1		3	
Total number	20			

The newest cranes, which are placed at Stadsgardshamnen, are level-luffing jib cranes representing the latest and best crane construction. Also the new 6-tons pontoon crane is equipped with a level-luffing jib. By these cranes the hoisting hook can be quickly moved to and fro in the direction of the crane arm and the hatches of the vessels can easily be reached without interference from the rigging. The second 6-tons pontoon crane belonging to the city is equipped with arrangements for weighing coal and coke.

The Port of Stockholm—continued.

As a rule, the Stockholm harbours are well equipped. The open spaces and roads have been paved with stone. There are railways and, where required, water, sewers, light, capstans, weigh-bridges, etc. They comprise extensive areas suitable for stores, warehouses, and industrial purposes, on which plots are leased at the rate of 1.50 to 3 kronor per square metre per annum. In the industrial harbour on Södra Hammarbyhamnen plots can also be purchased outright.

The natural inner and outer basins, which constitute the road of the port, are all of them spacious and have a great depth of water and good holding ground. They are provided with 85 mooring buoys in all.

The Free Port: Warehouses I (left), II and III.

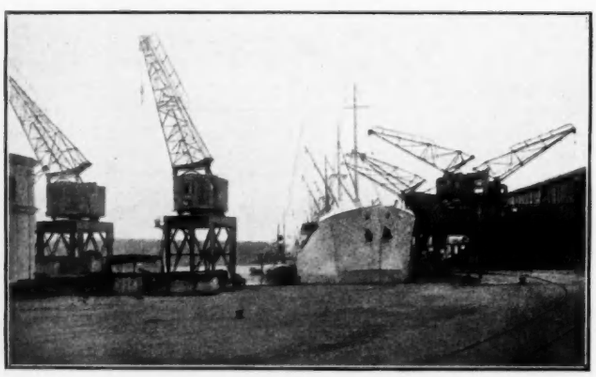
Tariffs and Regulations.

The following principal tariffs apply to the Customs Harbour of Stockholm: harbour dues; dues on goods left after a stipulated time on the quays, in sheds, warehouses or cellars of warehouses and custom houses; dues on goods stored; dues on storing of transit goods; charges for using cranes, capstans, elevators, gantry scales, and other harbour materials; dues for passing the locks of the city; and dues for passing through Alkistekanalen, Djurgardsbrunnskanalen, and Karlbergskanalen.

In addition the following tariffs have been prepared by the city: charges for harbour pilots, charges for the city weighers, and charges for the harbour rowers.

The above tariffs concerning the harbour dues and charges for using cranes, etc., are in due parts applicable also to the Free Port, together with charges for assistance and for using buildings, storage room, or storing place.

According to the tariff, harbour dues are to be paid for vessels on arriving at or leaving the port and for goods discharged at or loaded in the port. The harbour dues are, on vessels in foreign traffic, 15 öre per net register ton and, on vessels in domestic traffic, 8 öre per net ton. On vessels in regular overseas traffic the dues are 15 öre for every ton of goods discharged or loaded, not less, however, than 4 öre per net ton, and for other vessels in foreign regular traffic 10 öre per net ton. The dues on vessels in regular domestic traffic are

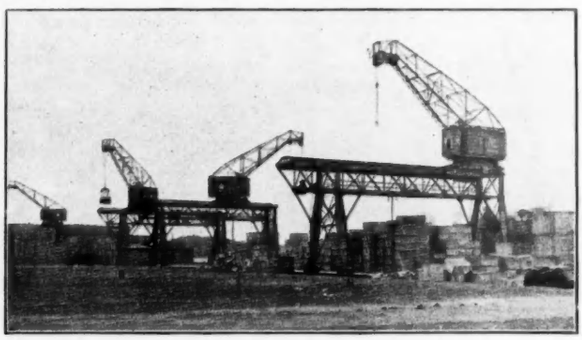


The Free Port, Northern part.

5 öre per net ton when they arrive and leave at least twice a month, and 3 öre per net ton when they arrive and leave at least once every working day. On touring vessels of 500 net tons and more only half the dues are levied. Vessels calling at the port for fuel or supplies for their own use or for repairs only are not liable to dues. The harbour dues on goods are assessed to a specified list. No dues are levied on goods dispatched to places within the country. Goods discharged or loaded at a private quay or wharf or from vessel to vessel are charged only at half rates, and the dues on goods reloaded within the port do not exceed 2 kronor—in certain cases 50 öre—per ton. The tariff of harbour dues prepared by the Harbour Board is approved by the City Council and confirmed by the Government. The Harbour Board is, however, authorised to lower or remit dues in cases without important consequences.

The imposition, collection and control of harbour dues in the Customs Harbour is in the hands of the Harbour Audit Department, for foreign tariff through the intermediary of the Customs Establishment and for domestic traffic through the intermediary of the Harbour Cash Office.

The dues on goods left beyond a stipulated time on the quays, in warehouses, and sheds or cellars of warehouses and custom houses are approved by the City Council on the proposal of the Harbour Board and confirmed by the Governor. According to



Five-tons Bridge Cranes on Norra Hammarbyhamnen.

the harbour rules, all goods stored in any of the above-mentioned places have to be removed before the end of the next working day. With the permission of the harbour master the goods may, however, remain free of charge for three days (bricks, sand, and gravel, five days) from the day of storing, Sundays and church holidays excluded. After the expiration of the stipulated time, dues are levied according to the above tariff unless for certain places otherwise stipulated. They are levied after a rate of 10-20 öre per square metre a day during the first three days (for iron beams and iron rods for concrete reinforcement 1 öre), increased by 5 öre—in one case 10 öre—after each of the third, the sixth and the eleventh days, until a maximum rate of 25-40 öre is reached.

The most important regulations relating to the port are: the harbour rules, comprising regulations governing the tariff in the harbour; instructions for the collecting of harbour dues; regulations for the use of sheds and warehouses; and regulations concerning the lock of Stockholm.

Customs.

As far as Customs conditions are concerned, the port of Stockholm is administered by the Central Customs Office at Stockholm with a Customs Director as chief. Premises for the inward clearing of vessels and goods are provided by the city through the Harbour Board at Stadsgarden, Skeppsbron, Norra Blasieholmshamnen, and Riddarholmen.

Barnangskajen, on the Eastern Part of Norra Hammarbyhamnen, with four 5-tons Bridge Cranes. Danviksbron in the background.

Premises for dealing with goods arriving by rail are provided at Barnhusstranden, north of Kungsgatan, and for mail goods at Kungsgatan 76, and Vasagatan 13. The Customs staff have rooms at their disposal in different parts of the port, as at Värtahamnen and Norra Hammarbyhamnen, where also clearance of bulk goods may be effected. Also in the Free Port, where there is a special Customs establishment under the direct supervision of the Customs Director, premises have been supplied for clearing and preventive purposes. In the Air Port proper premises have likewise been arranged by the city to be used for Customs purposes.

(Continued on page 351).

Annual Conference of the Institution of Naval Architects.

Professor of Dock Engineering Discusses Dock Problems.

ONE of the most interesting sessions of the annual conference of the Institution of Naval Architects, held at Liverpool, was that at which Mr. T. R. Wilton, M.A., M.Inst.C.E., discussed "The effect of growth in the size of cargo ships and their equipment with especial reference to Liverpool docks." Mr. T. R. Wilton is Associate Professor of Dock and Harbour Engineering at Liverpool University. He showed that the effect of the greater cargo capacity and higher speed of modern cargo carriers tended to make the percentage of time in port greater and created a demand for better cargo handling. The effect of increased size of cargo carriers on the transit sheds and their equipment required, he said, greater accommodation for cargo per foot run of quay in order to enable cargo to be dealt with conveniently. If a greater speed of cargo handling per hatch per hour was not attained, then the period of discharge of the larger modern vessels must be greater than for the smaller vessels of other days, and the advantage of increased size would be discounted. The port of Liverpool had for many years, he said, been in the forefront of progress, and the development of its docks and their equipment may be accepted as typical of progress at a first-class port. It was pre-eminently a port which dealt with cargoes of a mixed type. From the dock plan of 1859 it would be seen that the Liverpool Docks were built out into the river, and that their extension inland had been hampered by the close proximity of built-up parts of the town, thus necessitating lateral extension of the system. Comparing with each other the developments which had taken place from 1880 onwards, Mr. Wilton said it would be noted that there was a first system of rather lengthy rectangular docks running parallel to the river wall, practically all approached from open basins. Next where the area of ground permitted, the tendency was for the docks to be built with their longer sides at right angles to the river wall, and to enter them by river entrances, closed at the line of river wall by dock gates. The individual docks were still separated from each other by narrow passages. The final stage was that where both in the older portions of the dock estate which had been remodelled and in the new docks the various systems take the form of a waterway parallel to the river wall, with branch docks leading approximately at right angles from it. The entrances were either in the form of locks able to take one large vessel at a time, or a vestibule dock which was actually a large lock taking many vessels at one time. Taking the Albert Dock as a typical dock, though it was constructed in 1845, Professor Wilton said it was essentially a dock for sailing vessels, provided with buildings of several storeys, which served the dual purpose of transit sheds and warehouses, the upper floors serving as warehouses. This period might be regarded as about the conclusion of the great sailing era. This dock was equipped with hydraulic discharging appliances, whereas docks which, in other respects, were more modern in design, had single storey sheds, and no mechanical discharging appliances. The Alexandra Dock and its branches belonged to about 1890. In that system the plan was a main dock with approximately rectangular branches, and the transit sheds were of the single-storey type with no mechanical discharging appliances. Ten years later came the Canada Dock and its branches. These again were of the same type of lay-out, but with some of the transit sheds double storey, provided with a small number of hydraulic cranes, carried on the roof, for the purpose of discharging cargo.

Then in 1910 was Huskisson Dock and its branches. These were of the same general type of lay-out, but showed an advance both in the number of floors of the transit sheds—some being three-storey sheds—and also in the number of cargo working cranes provided. For the year 1920 the same system was taken, but it had received an increase in the number of hydraulic cargo cranes, and had also some electric cranes.

Evolution of Dock Entrances.

The new Gladstone Dock system was the most recent type, both as regards lay-out and equipment. Here, again, there is very extensive crane equipment, and electric working has taken the place of hydraulic power. In considering the effect of size of cargo vessel on the entrances to the docks, it must be realised that in a port such as Liverpool, where there had always been a large passenger traffic, this was less than would be expected, and that broadly speaking the passenger lines had been the predominant factor in settling the dimensions of the entrances. It was of interest to note the shape of the Albert Salthouse Passage built about 1870, with haunches to the sill, and to compare this with the box-shaped cross-section of the more modern entrances. A further rather curious point is that the great width of certain old entrances, such as the Canada Lock, was due to the fact that they were originally designed to accommodate paddle steamers. The result was that as the ocean-going paddle steamer was replaced by the screw vessel, some of these entrances were quite wide enough for the normal vessel of 50 years later, and only required deepening to bring them up to date.

The plan of docks where cargo was discharged and loaded had a ratio of quay length to water area which depended both on the shape of the dock and also on the size of vessels which used it. In the older type of dock, which was approximately square in plan, the ratio of length of quay to the water area of dock would be a minimum as compared with any other normal form of dock.

"As the quay length is a measure of the capacity of the dock for working cargo, this was apparently an inefficient form of lay-out. It must be remembered, however, that for sailing vessels the time for a voyage was very considerable, and that this form had then certain advantages. Vessels would lie in dock in safety, but not alongside the quay, sometimes so closely packed that it was said that a man could walk across the decks of the boats which were in the dock from one side to the other. Even with this type of dock, which in normally busy times would make it necessary for a vessel to await its turn to go alongside a discharging berth, the proportion of time in dock was far less than with modern steam and motor vessels, which make their voyages more rapidly, and the financial loss due to delay in dock would also be relatively less. The modern forms of docks give a great ratio of length of quay to water area for the same size docks, but as vessels have increased in size the waterways and widths of branch docks have also increased, and the net result is that the ratio has actually not increased, but decreased."

Requirements of Quay Space.

Another aspect of the dock as a structure for dealing with the discharge of ships is as to the number of yards of quay required to deal with each vessel. A large number of small vessels discharging with the same efficiency will obviously require fewer yards of quay than the same number of larger vessels. The number of yards of quay, divided by the average number of vessels discharging in the dock during a week, will, then, be a measure of this. The time in dock was not of the same importance in sailing-ship days as with the modern cargo carrier, but despite increase in size of vessel there has been an advance in the rapidity of turn-round. The effect of the greater cargo capacity and higher speed of modern cargo carriers is tending, said Prof. Wilton, to make the percentage of time in port greater, and so creating a demand for better cargo handling arrangements. He quoted the following figures relating to a typical steamer belonging to a famous line of cargo carrying vessels as being of interest in this connection:—

Year.	Capacity Tons.	Speed Knots.	Average Percentage of Time in Port.
1910	9,000	12	42
1910	7,400	12	37
1929	7,500	13	47
1929	7,600	13	40
1929	7,600	14	46

In dealing with the effect of growth in size of cargo carrying ships on the transit sheds and their equipment, Professor Wilton presented plans and cross-sections showing that the Albert Dock was surrounded by multiple-storey buildings, the upper floors of which were warehouses. It was noted that from the later single-storey shed, requiring no mechanical appliances other than ship's gear to discharge cargo, a change was made to two and three-storey transit sheds with mechanical appliances, until finally there was the Gladstone type of three-storey shed, with a flat roof, over which another roof may be placed to give four covered floors and enable some of the upper floors to be used as warehouses, as were the upper floors of the earlier buildings at the Albert Dock.

Some Interesting Comparisons.

Some interesting statistics were then quoted by Prof. Wilton referring to the main Liverpool Dock systems. Under the heading of quay ratios (lineal yards of quay per 100 square yards of water area of system), the figure for Albert Dock in 1882 was 2.37; Alexandra Dock, 1890, 1.84; Canada Dock, 1900, 1.92; Huskisson Dock, 1910 and 1920, 1.99; Gladstone,

Annual Conference of the Institution of Naval Architects—continued.

1930, 1.40. The yards of quay per vessel were:—Albert Dock (1882), 240; Alexandra (1890), 318; Canada (1900), 505; Huskisson (1910), 490; Huskisson (1920), 760; Gladstone (1930), 690. To show the increase in average cargo inwards, Albert Dock was credited with 1,211 tons; Alexandra, 2,343 tons; Canada, 2,792 tons; Huskisson (1910), 2,959 tons; Huskisson (1920), 6,011 tons.

The floor area of the respective docks in the years mentioned, in terms of number of square yards of floor area of shed per yard of quay, were in the following ratios:—Albert Dock (1882), 13.1; Alexandra (1890), 31.6; Canada (1900), 36.4; Huskisson (1910), 45.0; Huskisson (1920), 46.2; Gladstone (1920), 65.3; Gladstone (1930), 86.1. Thus the inward cargo per square yard of shed in the case of Albert Dock was 2.1 tons; Alexandra Dock, 12.1 tons; Canada Dock, 7.9 tons; Huskisson (1910), 7 tons; Huskisson (1920), 8.9 tons.

Concerning the cargo discharging equipment, the earlier hydraulic appliances which were used at the Albert Dock were portable jiggers, called also " elephants," and may now appear somewhat primitive to modern eyes; but the fact that they have recently done good work shows that they were well made. The erection of single storey sheds at a later period rendered it possible to dispense with elevating quay appliances, as the ship's own gear could discharge on to the quay and there was no upper floor to which cargo had to be lifted. The advent of the double storey shed, however, rendered some form of mechanical appliance necessary for raising cargo to the upper floor when discharging and hydraulic travelling roof cranes, sometimes called " sparrow cranes," placed on the roofs of transit sheds, were installed. The front wheels of these cranes ran on rails on the eaves of the shed, and the back wheels on a rail on the ridge of the shed. The last stage was reached with the types of cranes installed at Gladstone Dock, either roof cranes of great out-reach or portal quay cranes. In these latest types of crane installed at the Gladstone system the high command obtained, the luffing speeds, and the great outreach are especially notable. In actual working the high luffing speed and level luffing are of great advantage, as discharge of cargo can be rapidly carried on by working the crane mainly on luffing instead of slewing. Working by luffing enables a greater concentration of cranes to be attained on a given area and should permit of higher rates of discharge per hold being attained, thus facilitating rapid discharge of the greater amount of cargo carried per hold in the larger modern ships. The greater outreach of the modern quay crane is also a result directly attributable to the increase in size of ships, enabling the crane hook, if necessary, to reach to the far side of the hatchway of a large vessel, even if the latter is breasted off the quay. It also enables the crane to work conveniently into a hold when barges are lying between the ship and the quay.

Cargo Handling Appliances.

The object of providing a very complete installation of mechanical appliances is naturally to facilitate rapid working and under similar conditions to give a greater discharge of cargo per yard of quay per annum, and in consequence quicker turn-round for any ship.

In introducing the discussion, Mr. W. J. Willett Bruce said with all due respect to the Mersey Docks and Harbour Board he must say that the shipowners always set the pace and the Dock Board officials were always living more or less with a drawn sword over their heads with regard to providing accommodation for a thousand-feet ship. The companies built steamers which unfortunately, for some time after they were placed in commission, were not able to go into dry dock in Liverpool, but had to resort to Southampton and Belfast, until the fine Gladstone Graving Dock was built.

Sir John Biles said some years ago, in dealing with the evidence before the Dominions Royal Commission in which they were very much interested as to the future of ships, he ventured to suggest that a ship 1,000-ft. long, drawing 60-ft. of water, might be possible in the future. The two limitations were fresh markets for supplying the ships with cargo and the depth of water in the entrance of docks and harbours.

Mr. A. T. Wall said obviously a port must depend upon its dock equipment, and really the matter came down to dock equipment as against ship equipment. To equip a cargo ship properly involved the owner in a very great deal of first cost, all of which had to be carried through the life-time of the ship. If the dock equipment could deal with it, then the time might come when many ships would perhaps be able to run without any gear at all.

Cargo Handling Facilities at Ports.

In designing a cargo ship, naval architects must give consideration to the facilities at the ports at which that ship shall trade, said Mr. L. H. Cripps, C.B.E., at the 71st session of the Institution of Naval Architects, held at Liverpool. With the present rather illogical rules agreed upon commonly between the employers' associations and the workers' unions, the shipowner had to provide sufficient discharging gear to keep the men in the hold and on the quay reasonably busy. " It is true," he went on to say, " that the various ports throughout the world are gradually equipping themselves to cope with any special conditions existing at the particular port, but the shipowner must provide hatches of reasonable dimensions and the necessary winches and derricks to take advantage of overside and quay loading and discharging, and in some trades he must further provide facilities for dealing with heavy lifts. In addition there are problems of the relative efficiency of electric and steam winches, the speed at which they are to work, the type of derricks, wood or steel, and the best type of rigging." Mr. Cripps did not feel disposed to make any sort of comparison between electric and steam winches, or between various arrangements and numbers of derricks. The requirements of every ship must be worked out in detail and designed accordingly, although as a general rule experience goes to show that, with labour costs increasing and likely to increase, an efficient design will need to avoid the necessity for overtime, except under special conditions. The most serious problem of upkeep in itself is rust. When are we to have a rustless ship just as we have rustless knives? The enormous cost to shipowners of chipping and painting would, if it could be done away with, create a new epoch in shipping costs and, as it stands, offers probably the greatest opportunity for increased efficiency in the industry. With it goes the need for a metal that will withstand bottom growth, etc., to enable the shipowner to do away with regular dry-docking and bottom composition. The last important point in upkeep is the accommodation. As machinery becomes more efficient, when painting is done away with, and when steering becomes automatic, the crew will be very materially reduced in number, and with them can be reduced the numerous life-saving devices and accommodation, making room for extra cargo and saving wages and food.

In the discussion on Mr. Cripps' paper, Mr. R. J. Walker, C.B.E., joint managing director of Messrs. Parsons' Marine Steam Turbine Co., Ltd., said the question of the experience with modern machinery was one which, he thought, would have very great importance in any discussions between the relative merits of steam machinery and the Diesel. As regarded the question of upkeep, they were suffering from that epidemic known as " condensitis," and very seriously, too, yet very considerable progress had been made. It might be safely said that as the result of the experience of the Canadian Pacific steamships that difficulty had been practically eliminated. It was agreed that workmanship, materials and reasonable care in co-operation were very necessary for any installation, and it had always been the desire of the builders that those should have paramount importance in any installation.

The Port of Quebec.

The Acting High Commissioner for Canada in London has received from the Quebec Harbour Commission a copy of its report for the year 1929, which can be consulted by persons interested at the Canadian Building, Trafalgar Square, London, S.W.1.

The report in question gives a summary of the facilities available for shipping in the port, and, in referring to navigation during the year 1929, mentions that the season opened on March 7th and closed on December 23rd.

The steady increase in traffic which has been recorded annually during the past ten years was not maintained during 1929, the figures for which year are 10 per cent. less than those for 1928 in respect of exports. The decreased traffic, of course, is due to the postponement of grain marketing, and it is anticipated that 1930 will show a resumption of the former activity in the port.

The construction of the Wolfe's Cove terminal facilities undertaken in 1925 for the accommodation of deep-draught vessels progressed satisfactorily during the year, and it is expected that the new 40,000 ton C.P.R. steamship, " Empress of Britain," will be berthed at the new pier in the Spring of 1931. The depth of water being provided at the wharf and in the approach channel will be 40-ft. at low tide.

The " Shipping Register and Travel Guide," of July 12th, states that, in connection with the Wolfe's Cove development, which is an extension of Quebec Harbour, the Canadian Pacific Railway is starting at once on the construction of a branch line to connect with the tracks which the Harbour Commission will establish. This branch will leave the main line in the vicinity of the Quebec Power Company's gas plant and pass by tunnel under Belvedere Avenue, connecting with the Harbour Commission's tracks just east of the historic site of Wolfe's landing. The tunnel will be about a mile long.

The Port of London Authority.

Twenty-first Annual Report for the Year ending 31st March, 1930.

Trade of the Port for the Year.

Shipping Arriving and Departing.

THE total net register tonnage of vessels that arrived and departed with cargoes and in ballast from and to foreign countries and British possessions and coastwise during the years ended December 31st, 1913—1929, was as follows:—

		Tons.			Tons.
1913	...	40,080,282	1921	...	34,089,783
1914	...	37,154,133	1922	...	39,293,139
1915	...	30,890,531	1923	...	41,214,928
1916	...	24,976,437	1924	...	45,392,649
1917	...	18,053,002	1925	...	47,064,975
1918	...	14,564,008	1926	...	49,278,173
1919	...	26,335,191	1927	...	52,576,755
1920	...	32,758,604	1928	...	55,423,681
			1929	...	57,578,355

The totals for the years 1914 to 1918 do not include the tonnage of many of the vessels engaged on Government service in connection with the war.

Shipping Paying River Tonnage Dues.

The net register tonnage and deck cargo tonnage of shipping which was liable to and paid river tonnage dues inwards or outwards during the twelve months ended March 31st, 1930 and 1929 respectively was as follows:—

		1930.		1929.		Percentage Increase.
Foreign	Inwards	21,417,036		20,285,473		5·6
	Outwards	11,723,156		10,994,363		6·6
			33,140,192		31,279,836	5.9
Coastwise	Inwards	7,450,958		7,040,806		5.8
	Outwards	2,547,587		2,490,396		2.3
			9,998,545		9,531,202	4.9
			43,138,737		40,811,038	5.7

There was thus an advance of 2,327,699 tons, composed of 1,860,356 tons in the foreign and 467,343 tons in the coastwise trade.

Shipping Using the Wet Docks.

Of the total net register tonnage and deck cargo tonnage of shipping shown in table above that paid river tonnage dues, 61.4 per cent. used the wet docks of the Authority, compared with 61.6 per cent. during the twelve months preceding, as follows:—

		1930.		1929.		Percentage Increase.
Foreign	Inwards	15,520,989		14,684,279		5.7
	Outwards	8,800,443		8,363,786		5.2
			24,321,432		23,048,065	5.5
Coastwise	Inwards	1,311,840		1,246,566		5 2
	Outwards	847,935		831,420		2.0
			2,159,675		2,077,936	3.9
			26,481,107		25,126,051	5.4

Shipping Using the Dry Docks.

The shipping entering the dry docks of the Authority during the twelve months was 509,841 tons more than that of the previous year, viz.:—

1930 Tons Gross.	1929 Tons Gross
3,422,888	2,913,047

Imports and Exports.

The values of the total imports and exports (excluding coastwise goods) of the United Kingdom and six principal ports for the year ended December 31st, 1929, were as follows:—

	1929. £	1928. £	Percentage Increase or Decrease on 1928.
United Kingdom	2,059,816,450	2,039,460,746	+ 1.0
London (including Queenborough)	705,237,524	692,730,351	+ 1.8
Liverpool	477,077,169	485,386,171	— 1.7
Hull	109,274,207	108,349,364	+ 0.9
Manchester (including Runcorn)	99,886,967	98,464,723	+ 1.4
Southampton	96,207,794	94,885,022	+ 1.4
Glasgow	81,695,332	88,181,953	— 7.4

During the twelve months ended March 31st, 1930, the Authority landed or received 2,280,292 tons of import goods for warehousing or for immediate delivery, an increase of 200,776 tons, or 9.7 per cent., on the tonnage dealt with during the previous twelve months.

The stocks of goods at the end of March, 1930, in the warehouses directly controlled by the Authority amounted to 645,036 tons, as compared with 585,637 tons at the corresponding date in 1929, an increase of 59,399 tons.

The export traffic handled on the dock quays during the twelve months amounted to 727,585 tons, being an increase of 11,898 tons on the previous year's figure of 715,687 tons.

Finance.

Borrowing Powers Authorised and Exercised.

The balance of borrowing powers unexercised at March 31st, 1930, amounted to £4,242,042, as follows:—

	£	£
Total amount authorised		43,000,000
Borrowed:—		
(a) Port Stock issued and outstanding ...	34,142,698	
(b) Port Stock purchased and extinguished	447,761	
(c) Port Stock redeemed	17,499	
(d) Withdrawn from Stock (Redemption) Funds	2,150,000	
(e) Port of London Bills issued and outstanding	2,000,000	
		38,757,958
Balance of borrowing powers unexercised ...		£4,242,042

Notice of Exercise of Option to Redeem Stock.

On November 15th, 1921, the Authority made an issue of £2,000,000 Port of London 6 per cent. Inscribed Stock at £96 per cent., repayable at par on July 1st, 1940, or at the option of the Authority on or after July 1st, 1930, on giving six months' notice. The Authority decided to exercise their option and gave the requisite notice for repayment on July 1st, 1930.

Port of London Bills.

Bills to the amount of £1,000,000 which were outstanding on March 31st, 1929, matured on April 25th, 1929, and were repaid by an issue of £1,000,000 three months' bills, which matured on July 25th, 1929.

Further issues were made as follows:—

25th July, 1929 ...	£1,500,000—Six Month's Bills, maturing 25th January, 1930.
25th January, 1930 ...	£2,000,000—Six Month's Bills, maturing 25th July, 1930.

Temporary Loans.

Temporary loans were obtained during the year and an amount of £80,000 was outstanding at March 31st, 1930.

Capital Expenditure.

The capital expenditure for the year ended March 31st, 1930, amounted to £773,396.

Utilisation of Redemption Funds in Exercise of Borrowing Powers for £150,000.

By reason of the appropriation of additional capital receipts to the Stock (Redemption) Funds, the Authority has been enabled to use a further sum of £150,000 for capital purposes as an application of its borrowing powers.

Stock (Redemption) Funds and Capital Redemption Account.

The amount standing to the credit of the Funds at March 31st, 1930, was £951,381. The investments held on account of these Funds stand in the books at a value of £729,927, leaving a balance of £221,454 uninvested.

Supplementary to the statutory requirements in regard to Port Stock, provisional Redemption Funds are in operation for the redemption of certain expenditure in respect of which borrowing powers have not yet been exercised. The balance of these Funds at March 31st, 1930, amounted to £547,812.

The capital redemption account now stands at £1,648,000, representing a decrease of £298,899 during the year.

Working Results.

The following is a summary of the year's working:—

	£
Total Revenue	6,103,295
Total Expenditure	4,520,238
Balance of Revenue	1,583,057
Less—	
Interest on Port Stock and Temporary Loans, Sinking Fund Charges, etc., less Interest, &c., receivable ...	1,459,009
Surplus Revenue for the year	124,048
Balance brought forward from 31st March, 1929	396,584
Balance carried forward ...	£520,632

The Port of London Authority—continued.

General Fund for the Maintenance and Renewal of Premises and Plant and for Dredging.

The balance standing to the credit of this Fund is £400,063, being a reduction of £214,317, which latter amount represents the expenditure during the year.

General Reserve Fund.

The amount of the Reserve Fund remains at the statutory maximum of £1,000,000 prescribed by Section 107 (1) of the Port of London (Consolidation) Act, 1920, and is fully invested in Trustee securities, which stand in the books at less than mean market prices at March 31st, 1930. The Fund reached the maximum during the year ended March 31st, 1922, and since that date the interest on the investments has been credited to net revenue account.

Insurance Fund.

This Fund is utilised to bear all the Authority's insurance. The amount standing to the credit of the Fund at March 31st. 1930, was as follows:—

	£
Amount at 31st March, 1929	602,174
Added since—Income accumulated from Investments	22,630
	624,804
Less—Losses, Reinsurances, etc., during the year	19,189
Amount at 31st March, 1930	£605,615

The investments held on account of the Insurance Fund stand in the books at a value of £602,174.

Auditor.

The Ministry of Transport reappointed Sir William Plender, Bart., C.B.E., of the firm of Deloitte, Plender, Griffiths and Co., to be auditor of the accounts of the Authority for the year ended March 31st, 1930, in accordance with the provisions of Section 109 of the Port of London (Consolidation) Act, 1920.

Works and Improvements.

Progress of Works.

India and Millwall Docks.—Stage 2 of the India and Millwall Improvement Works, which Stage consisted (a) of a new entrance lock, 590-ft. long, 80-ft. wide, 35-ft. deep below T.H.W., approximately on the site of the original South West India Dock entrance, and (b) filling in of the passage between the Blackwall Basin and the Export Dock and removal of the knuckles between the South Dock and the Basin, has been completed, the new lock having been opened for shipping on September 5th, 1929.

Stage 3, which comprised the diversion of goods railways between the Exchange Sidings and the Millwall Dock to the west side of the West India Dock to avoid crossing the New Entrance Lock, has also been completed, and railway traffic was passed over the diverted lines on January 21st, 1929.

Good progress has been made with the shed and quay equipment of the South West India Dock, which work was comprised in Stage 4.

Two of the five new transit sheds on the South Quay have been completed and brought into use. The other sheds, together with the railway and road communications, are well advanced.

Improved railway and road facilities have been provided to three transit sheds on the North Quay and work has been commenced on four new sheds and equipment at the East Wood Wharf.

An impounding station has been erected and brought into use at the old Limehouse entrance.

Surrey Commercial Docks.—Considerable progress has been made in the development of Lavender and Acorn Ponds to provide additional accommodation for the softwood trade. The widening of the passage from Stave Dock and the new quay on the eastern side of the Ponds have been completed. One of the new sheds has been brought into use for the storage of timber, and the construction of the remaining two sheds is approaching completion. The impounding plant is installed and in use.

Royal Victoria Dock.—Good progress has been made with the repair work at the western entrance. The outer gate chamber has been repaired, the gates restepped and repairs to the inner gate chamber are now in hand.

Tilbury Docks.—New Entrance Lock, 1,000-ft. long, 110-ft. wide, and 45½-ft. below T.H.W., situated 1,200-ft. above Tilburyness; New Dry Dock at the eastern end of the Tilbury Main Dock, 750-ft. long, 110-ft. wide, 37½-ft. below T.H.W. on sill and blocks. These works have been completed and the entrance lock was formally opened on September 26th, 1929, by Lady Ritchie of Dundee on board the s.s. "Oronsay," which was kindly placed at the Authority's disposal for the ceremony by the Orient Steam Navigation Company. The first vessel entered the new dry dock on September 27th, 1929.

Tilbury Landing Stage, 1,140-ft. Long, with Baggage Hall, Etc.—The whole of these works, including the remodelling of the Tilbury Station by the London Midland & Scottish Railway, are practically completed. The berth at the landing stage has been dredged to a depth of 35-ft. at low water.

River Moorings.—The Authority decided to improve certain public moorings for ships in the river, and to provide two new mooring berths for ships at Swanscombe and Woolwich. The work is in hand.

Dredging.—During the year dredging has been carried out for the maintainance and improvement of the channels of the river, and 1,212,770 cubic yards of material have been removed. The quantity of mud removed from the docks during the year was 1,487,348 cubic yards. The dredging of the Surrey Canal throughout its length is approaching completion.

General.—The policy of bringing the Authority's undertaking and its equipment into an adequate state of repair and efficiency has been continued and further authorisations for this purpose have been made for the ensuing year.

Works for Relief of Unemployment.—In connection with the consideration by H.M. Government of schemes for the relief of unemployment, proposals have been submitted to the Minister of Transport for works of improvement in the road transport facilities to and from the docks, and a definite programme of improvement works at the docks has been submitted to the Unemployment Grants Committee.

General.

Reduction in Rates.

A revised schedule of dues and rent on shipping was brought into operation on January 1st, which included a reduction in dock dues on vessels laden from or for ports outside Europe, the Mediterranean Sea and the Black Sea, and other alterations and revisions.

Reductions have also been made in the charges on certain goods.

In accordance with the intention of the Local Government Act, 1929, relief from local rates amounting to approximately £150,000, obtained by the Authority in respect of the portion of their undertaking assessed for freight transport purposes under the provisions of the Rating and Valuation (Apportionment) Act, 1928, has been passed on to users of the port in the form of reductions in port rates, dock dues and charges.

Representative in South Africa.

Mr. E. J. Hartley, a director of Messrs. Chubb and Maxwell, Ltd., of Capetown, has been appointed to represent the Authority's interests in South Africa.

Pension Fund for Widows and Orphans.

The Authority agreed to the establishment by their staff of a fund to provide pensions for the widows and orphans of members of the permanent pensionable upper division male staff. The fund is not guaranteed by the Authority and is maintained entirely by contributions from the staff, the Authority merely bearing the slight cost of administration.

Additions to Floating Plant.

The Authority placed in commission a new floating grain elevator—the "Thomas Wiles."

Wreck Service.

Fifty-six vessels were removed from the river by the wreck raising plant during the year, viz.:—One sea lighter measuring 1,100 tons, one auxiliary schooner measuring 55 tons, 49 sailing vessels and barges measuring 3,032 tons, and five small motor and sailing craft. In addition, one steamer measuring 703 tons and 17 sailing vessels and barges measuring 953 tons were removed from the docks.

River Purification.

Representatives of the Authority attended on January 9th a conference convened by the Ministry of Health to investigate the subject of the drainage of Greater London. The decision of the Ministry of Health on the general question has not yet been given, but in the meantime the Department have offered to assist in dealing with any individual cases in which existing sewage disposal works are inadequate to maintain a satisfactory effluent.

Parliamentary—Dartford and Purfleet (Thames) Tunnel Bill.

The Authority viewed with considerable apprehension proposals contained in a Bill promoted jointly by the Essex and Kent County Councils for powers to construct a tunnel under the River Thames between Dartford and Purfleet at such a depth that the crown of the tunnel would be only 12-ft. 9-in. below the present bed of the river with a limit of deviation 10-ft. upwards from that depth. Any such tunnel would have pre-

The Port of London Authority—continued.

vented the Authority from dredging a navigable channel of an adequate depth for vessels of such increased size as might be expected in the future.

After prolonged negotiations a settlement was reached whereby the tunnel, if authorised, would be constructed at such a depth as to permit the river being dredged to 50-ft. below Admiralty Chart Datum (low water).

Election of Members.

The regulations with respect to the formation and revision of the register for the election and the method of election of elected members of the Authority have been revised by the Ministry of Transport and are now awaiting formal confirmation. The revisions are designed mainly to secure greater equality in the representation of the respective interests of "goods" and "vessels" and to provide for the separate representation of the "owners of river craft."

Members.

Vice-Admiral Alan Geoffrey Hotham, C.B., C.M.G., was appointed by the London County Council, in December, 1929, to fill the vacancy caused by the retirement of Admiral Sir Algernon D. E. H. Boyle, K.C.B., C.M.G., M.V.O.

Captain Owen Jones, C.B.E., R.D., was appointed by the Trinity House, in March, 1930, to fill the vacancy caused by the retirement of Captain Thomas Golding, C.B.E.

The Authority reappointed Mr. J. D. Gilbert, D.L., J.P., to be a Conservator of the River Thames until March 31st, 1933.

Bombay Port Trust.

At a meeting of the Trustees of the Port of Bombay, held on 29th July, 1930, the following were the main items of business disposed of:—

The tender of the Barrow Haematite Steel and Iron Co., Ltd., amounting to Rs. 12,350 for the supply of 240 rolled steel clip rails for renewal of railway tracks in Alexandra Dock, and the tender of Messrs. Sir Henry Bessemer & Co., Ltd., amounting to Rs. 13,300 for the supply of 90 wheel tyres for locomotives and bogies were accepted.

An expenditure, estimated at Rs. 6,210, was sanctioned against the relative budget provision for renewal of woodwork of certain sheds at Sassoon Dock.

Following the practice obtaining on the railways, the Board decided that Port Trust employees incapacitated for further service on account of injury sustained while on duty should be eligible for grant of retiring gratuity under the rules, in addition to the benefits admissible under the Workmen's Compensation Act.

The pay of certain of the Port Trust Railway inferior staff was revised so as to bring them into line with the scales recently approved by the Railway Board for corresponding staff on State Railways. This was in fulfilment of an undertaking given by the board in May last to the Bombay Port Trust Railwaymen's Union.

A short-term renewal of lease of Rent Roll No. 1,024 (area 1,872 sq. yards), Sewri, was granted at the existing rate of rent, viz., Rs. 1-8-0 per sq. yard per annum.

Imports and exports at the Port of Bombay:—

	1929 Quarter ended 30th June.			1930 Quarter ended 30th June.		
	Import Tons	Export Tons	Total Tons	Import Tons	Export Tons	Total Tons
Docks	597,253	693,590	1,290,843	487,169	591,062	1,078,231
Do. Transhipment	59 023	52,677	111,700	31,062	33,716	64,778
Bunders ...	281,232	105,189	386,421	242,878	106,181	349,059
Total ...	937,508	851,456	1,788,964	761,109	730,959	1,492,068

Vessels (other than ferry steamers, hired transports, Government vessels and country craft) which entered and left the Port of Bombay:—

	1929 Quarter ended 30th June.		1930 Quarter ended 30th June.	
	Number	Net register Tonnage.	Number	Net register Tonnage.
(A) Entered.				
Vessels engaged in foreign trade	222	822,011	224	846,435
Vessels engaged in coasting trade	507	479,991	479	408,530
Total ...	729	1,302,002	703	1,254,965
(B) Cleared.				
Vessels engaged in foreign trade	166	642,465	175	691,652
Vessels engaged in coasting trade	574	719,944	501	555,158
Total ...	740	1,362,409	676	1,246,810

Improved Arrangements for Customs Examination of Baggage of Coastal Passengers.

At a meeting of the trustees of the Port of Bombay held on 12th August, 1930, the following were the main items of business disposed of:—

With a view to improving the arrangements in Prince's and Victoria Docks for the Customs examination of coastal passengers baggage, the Board decided to abolish the present system of centralised examination in the "Gray Hall" which entails considerable cost and delay to passengers and creates considerable congestion of traffic. In consultation with the Customs Authorities and the Steamship Companies concerned, it has been decided to reserve areas in the transit sheds adjoining the berths of disembarkation and to provide luggage benches, barriers, lights and fans similar to the arrangements for examining baggage at Ballard Pier. The cost, estimated to be Rs. 7,885/-, was sanctioned by the Board subject to the necessary sanction of Government. The "Gray Hall" will in future be retained by the Customs Department for the examination of silk piecegoods and other drawback work.

Consequent on the B.I.S.N. Co. agreeing to surrender their preferential use of No. 14 berth, Victoria Dock, which will secure to the Port Trust a much-needed additional berth, it was decided to operate the company's slow Karachi Service vessels from Nos. 3-4 berths with their Gulf Line service as soon as the necessary alterations can be carried out. The Board sanctioned an estimate amounting to Rs. 4,979/- for these alterations and the provision of suitable latrine accommodation at 3-4 berths, Victoria Dock.

The following Leases were granted:—

(1) A 99-year Lease of Plot No. 2 (area 721 sq. yards) on the Old Cotton Green at Colaba for erection of a first-class residential building.

(2) A 30-year renewal at revised rates of leasehold rent roll No. 139 (area 466 sq. yards), Argyle Road, Elphinstone Estate, for godowns.

(3) A 3-year renewal at the present rate of leasehold rent roll No. 1019 (area 1,060 sq. yards), Sewri, for godowns.

(4) A surrender of leasehold rent roll No. 171 (area 355 sq. yards) at the junction of Argyle Road and Carnac Bunder Siding Road, expiring in September, 1931, was accepted and a new lease of the same area was granted for 30 years at revised rates for shops and godowns.

In reply to a reference from the Government of India on the subject of the Draft Convention requiring the weight to be marked on heavy packages transported by vessels, which was adopted by the International Labour Conference in 1929 with a view to lessening the risk of accident to dock workers and has been provisionally ratified by the Government of India, it was decided to inform Government that while the Trustees are of opinion that Government legislation would make for uniformity of practice in the various ports, they are agreeable to the Government proposal that the object of the Convention could satisfactorily be enforced by means of suitable bye-laws framed by the port authorities.

Twin-screw Motor Tug.

Considerable talk has been heard recently regarding the dearth of orders for floating property being received by this country from Latin America. It is a pleasure, therefore, to learn that a British firm of shipbuilders, James Pollock Sons & Co., Ltd., of 3, Lloyd's Avenue, London, and Faversham, Kent, are at the present time building a powerful twin-screw motor tug for service in South American waters.

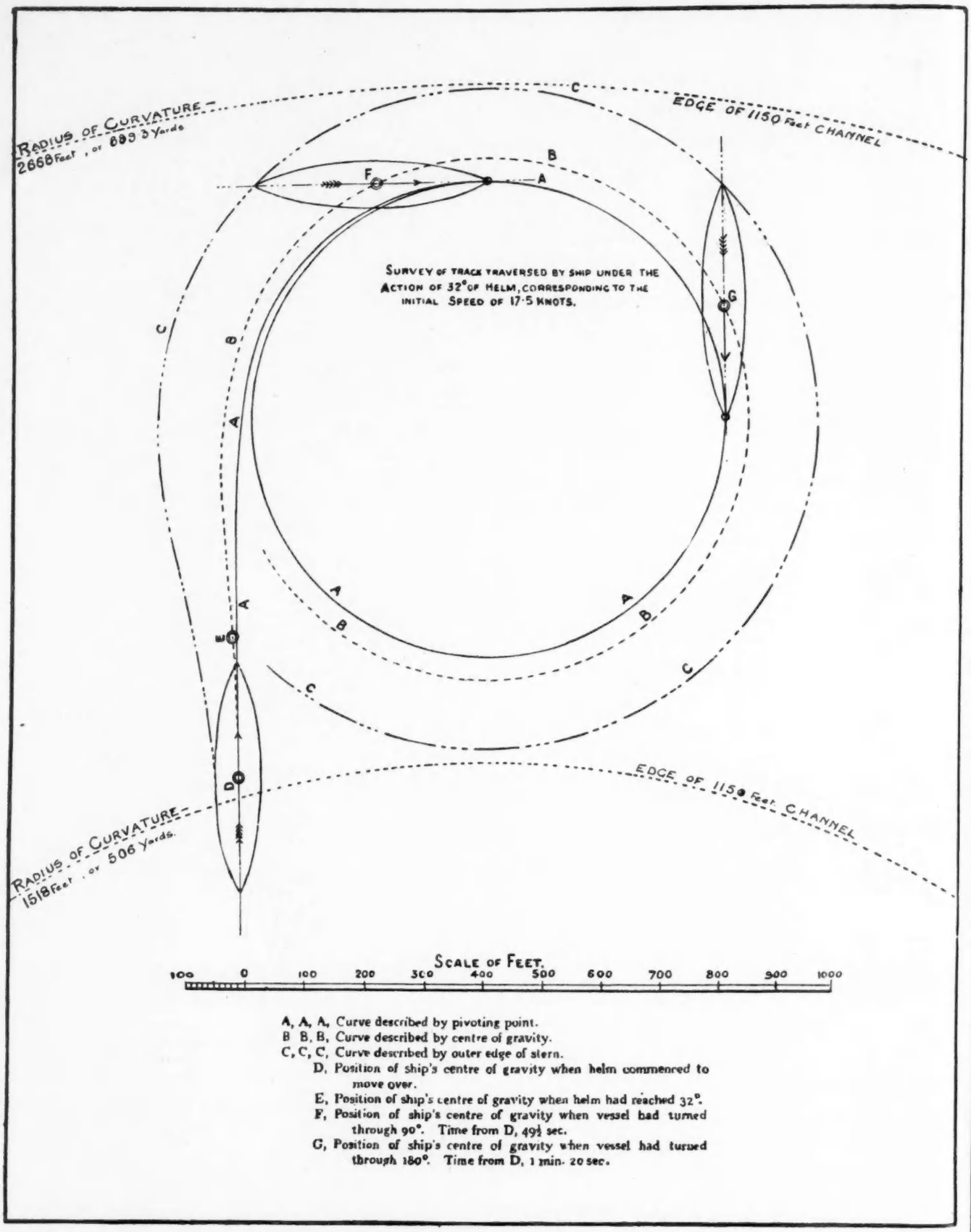
This vessel, which is of the tunnel type, is being built under Lloyd's survey with straight stem and square stern, and is 60-ft. long, 17-ft. breadth moulded, and has a draft of 8-ft.

She will be fitted with two 120 b.h.p. Bolinder reverse gear motors, making her total power 240 at 375 r.p.m. The engines are of Messrs. Bolinder's latest design and will give the vessel a speed of about 12 miles per hour.

The vessel has accommodation for a crew of six, a store room aft, motor room amidships, and chain locker forward.

As a further point of interest we understand that when this tug is completed she will be shipped to her destination in one piece on steamer's deck.

Dredged Channel Curves.


RADIUS OF CURVATURE
2668 Feet, or 889 3 Yards
EDGE OF 1150 Feet CHANNEL
SURVEY OF TRACK TRAVERSED BY SHIP UNDER THE ACTION OF 32° OF HELM, CORRESPONDING TO THE INITIAL SPEED OF 17·5 KNOTS.
RADIUS OF CURVATURE
1518 Feet, or 506 Yards.
EDGE OF 1150 Feet CHANNEL
SCALE OF FEET.
100 0 100 200 300 400 500 600 700 800 900 1000

A, A, A, Curve described by pivoting point.
B, B, B, Curve described by centre of gravity.
C, C, C, Curve described by outer edge of stern.
D, Position of ship's centre of gravity when helm commenced to move over.
E, Position of ship's centre of gravity when helm had reached 32°.
F, Position of ship's centre of gravity when vessel had turned through 90°. Time from D, 49½ sec.
G, Position of ship's centre of gravity when vessel had turned through 180°. Time from D, 1 min. 20 sec.

Diagram illustrating the relation of vessel 370-ft. in length to a channel 1,150-ft. in width, when turning under speed and helm engines moving ship ahead only.

Dredged Channel Curves.

By E. C. Shankland, F.R.S.E., F.R.Met.S.

Their relation to the Turning Circle of Ships.

THE engineer embarking on the development of a river or tidal waterway by means of dredging may have to consider the radius of the curve or bend to which he will align the channel, having regard to the turning circle of the ships which not only will use the channel on completion of dredging, but he may also have to provide for the growth in dimension of the shipping using the waterway and consequently future accommodation in channel depth and width.

The natural tendency in river channels is to form a series of deep water pools on the concave sides of the bends with shallows at the intervening positions where the current passes over from one side of the stream to the other.

In tidal rivers the flood tide complicates these conditions, but generally has the effect of creating a pool on the opposite or reverse curve and thus there are usually two pools in the same reach with a crossing or shoal area between them. The foregoing formations are especially common to embanked rivers or tidal waterways having a sinuous watercourse. To improve these hydraulic and hydrographic conditions there are now several methods adopted. We do not intend to do more than enumerate the principal ones here:—

(1) Embanking and groyning the natural channel.
(2) Canalising and pool filling (practised in Holland to maintain a level bottom by means of mattress work).
(3) Rivetting, i.e., constructing dykes which train the channel below half-tide level.
(4) Dredging, accompanied by above methods of channel training or alternatively without any artificial aids.

It is now many years since Mr. Girardon advocated at the 6th International Congress of Navigation the retention of the sinuous watercourse in rivers with gentle slopes at the pools and steeper ones at the bars, and to create the improvement by converting poor crossings when ever they occurred into good ones, the result to be obtained by giving a suitable direction to river currents across the bars. When combined with the investigations of Mr. Fargue on the "Influence of Bends on Channel Depths," it led to a new conception of the proper functions of the works constructed to improve channels.

The direction which the works of contraction gave to the confined waters became of more importance than the relative amount of contraction, and could be given such a direction as to produce the proper effect on the bars or crossings.

When this method is followed the sinuous course of the river is preserved and even intensified. It is to this limit of channel curvature that we would draw attention. In "Kempfe's Engineer's Year Book" (1917), 24th Edition, reference is also made to this matter, and it is stated that, generally speaking, for vessels of 400 to 500 tons, moving at a fair rate of speed, a radius of 500 yards should be regarded as a minimum—at low speeds 200 yards will suffice for radius of curvature. The minimum for vessels of very small tonnage (say under 200 tons) may be as low as 66 to 88 yards. It will be obvious, however, that in addition to the radius, speed and tonnage factors there are others; for instance, the draft of the vessel is important as it governs the ratio of displacement or cross section of vessel to cross section of channel.

Mr. G. S. Baker in his work, "Ship Form, Resistance and Screw Propulsion," deals fully with the relation of ship to channel. This the channel designing engineer should study to fully appreciate. He explains that in restricted water channels, if a vessel is passing through a channel of gradual constriction, the cross section of the stream lines around the ship must also be gradually reduced, and the changes of velocities and pressures must therefore be increased. In shoal water the conditions become more favourable for eddy making. Professor Havelock has also shown that a travelling point of pressure creates waves of greater divergence in shallow than in deep water, and this divergence increases with speed, and ultimately at a critical speed they are all concentrated in a large transverse wave somewhat similar to a wave of translation. Above this speed only divergent waves are possible. The critical speed is given by $V^2 = 11.5 \times d$.

V being speed in knots, d the depth of water in feet.

Schutte has tested several ship forms in channels of varying width and depth and in what may be called open and unlimited water. Taking first the case of the cargo boat, the increase in resistance at any speed over the open water value was approximately the same for a broad, shallow channel as for a narrow and deep channel, provided the ratio $\frac{\text{depth of water}}{\text{draft of ship}}$ in the former and $\frac{\text{width of channel}}{\text{beam of ship}}$ in the latter were the same. This only applies to the ordinary low speeds at which such a vessel would run when wave making is not very important. Over this range of speed the percentage increase of resistance was roughly constant for any given size of channel. The result of several experiments show that, in a confined channel, the deep vessel suffers more than the shallow one, and that a cross section area of channel about 200 times that of the vessel is required at all normal speeds if the resistance is not to be affected by the boundaries. At low speeds a smaller size can be allowed, the necessary ratio of areas being about 150.

It has been shown that there must be a depth of water equal to 14.0 to 7.0 drafts when there are no side boundaries, and a breadth of channel equal to 10.0 to 8.0 beams when the water depth is very great. When both side and bottom boundaries are present these numbers naturally increase somewhat.

Behaviour of a Ship under Speed and Helm.

In practical navigation, when it is found that the depth accompanied by width and curvature of channel are such as to make steering uneasy or the vessel unresponsive to the helm, two actions may be taken. If the vessel has twin or multiple screws the speed on one set of engines can be eased or stopped and the other increased, thus imparting a better turning movement to the ship. If the vessel is a single screw vessel or of the larger dimensions with twin or multiple screws, the occasion may render it advisable in practice to make a tug fast ahead to assist in the navigation of such bends.

A vessel, when turning under the influence of helm and engines only—that is to say, the propeller or propellers working in the direction to force the vessel forward—behaves in a manner now properly defined.

The vessel usually turns or pivots on a point well forward in her middle line, and the curve described by the centre of gravity of the ship is slightly outside the circle described by the stem or forefoot. The centre of gravity, in fact, travels outward immediately from the line of original course when the helm is put over, and the stem of the ship is involuntarily carried into the channel if the vessel is on the starboard side of the fairway and the vessel under starboard helm. The maximum distance that the ship's centre of gravity travels in her original direction after the helm is put over is termed the "advance." For an approximate investigation of the forces in operation during the turning of a ship, the motion may be divided into three stages:—

(a) When the rudder is first put over and the pressures on the hull are those which produce angular acceleration.

(b) When the accelerated forces are combined with those caused by the resistance of the ship to rotation.

(c) When finally turning uniformly in a circular path.

The character of the forces acting during states (a) and (c) can be ascertained and the type of motion under the complex represented by (c) will consist of a gradual replacement of the motion at (a) by that at (c). (See diagram turning circle.)

Now the problem before the Hydrographic Officer or Engineer is to provide a channel curve with as convenient a depth and stream line flow as nature will permit. Water in flow tends to hug the concave bank in sympathy with the pool formation.

When resistance increases by the combination of ship form and channel form to an extent which makes the navigation difficult for large vessels, channel rectification by dredging or re-alignment may be desirable.

We have actually found that a decrease in the radius of curvature of a dredged channel previously having a mean radius of 1,736 yards to a mean radius of 1,389 yards has improved rather than restricted the manoeuvring of large vessels by (a) increasing the water area permanently by adoption of the pool area on concave side; (b) leaving the convex point or salient in repose with the beneficial effect of cultivating a more natural stream line and producing better channel maintenance above and below the salient.

To crystallise the matter of dredged curves at bends in rivers tidal or non-tidal, we have therefore to consider:—

(1) Size of vessels and whether twin or single screw.
(2) Facilities for assistance around bends by tugs.

Dredged Channel Curves—continued.

(3) To what extent the known factors of cross sectional area of channel to cross sectional area of ship will operate in the bend or curve under consideration.

(4) Hydrographic conditions upstream and downstream of the bend or curve under consideration.

There remains also for study in this connection the theories and experiments of Professor James Thompson regarding the formation of pools and salients at bends in rivers flowing under the action of gravity to the sea.

Professor Jas. Thompson pointed out (Proc. Roy. Soc., 1877), Proc. Inst. Mech., Eng., 1879, page 456, that the usual supposition is that water tending to go forward in a straight line rushes against the outer bank and scours it, at the same time creating deposits at the inner bank. That view is an incomplete account of the matter, the Professor having given a more ingenious account of the action at the bend, which he completely confirmed by experiment. Thus, when water moves round a circular curve under the action of gravity only, it takes a motion like that of a free vortex. Its velocity is actually greater, parallel to the axis of the stream at the inner side than at the outer side of the bend. Hence the scouring at the outer side and depositing at the inner side of the bend are not due to mere difference in velocity of flow in the general direction of the stream, but in virtue of centrifugal force, the water passing round the bend presses outwards and the free surface in a radial cross section has a slope from the inner side upwards to the outer side. For the greater part flowing in curved paths, this difference of pressure produces no tendency to transverse motion, but the water immediately in contact with the rough bottom and sides of the channel is retarded and its centrifugal force is insufficient to balance the pressure due to the greater depth at the outside of the bend. It therefore flows inwards towards the inner side of the bend, carrying with it detritus which is deposited at the inner bank. Conjointly with the flow inwards along the bottom and sides, the general mass of water must flow outwards to take its place.

Professor Thompson's observations were obviously directed more to fluvial curvatures sensitive to scour, but in tidal rivers with pitched embankments the same conditions may apply on the ebb tide at certain bends, the velocity being greater at the inner side of the axis than at the outer side, and the duration of the ebb tide being the dominating period of flow.

Notes from the North.

Smart Work.

RECORDS in quick cargo handling continue to be made in the port of Liverpool, the latest being the smart turn-round of the Canadian Pacific liner "Duchess of Richmond," which, within 29 hours of her arrival at Liverpool, unloaded and loaded and again sailed from the Liverpool landing stage. She arrived in the Mersey from Montreal with 300 passengers and 2,000 tons of general cargo on board. She docked in the Gladstone and immediately a small army of men boarded her and began unloading at top speed. Simultaneously another small army of workers set to work to clean out the numerous staterooms and cabins in preparation for the 300 passengers who were to board the "Duchess" for her return trip to Montreal and to burnish up various parts of the vessel with paint. As the holds of the ship were emptied of their cargo from abroad they were immediately stored with outgoing merchandise until 3,000 tons had been taken on board. She then left the dock. Thus a week's work was compressed into a day and a-half.

Cheap Rides by Dock Railway.

Liverpool Overhead Railway Company, whose line runs from one end of the dock estate to the other, has decided upon a bold experiment in cheap transport—six and a-half miles for one penny. Each Saturday and Wednesday evening throughout September the company offer excursion tickets from any station to any other station on the railway for the nominal sum of 1d. for the single journey, available after 6.30 p.m. on the days named. People boarding the train at Seaforth for the Dingle or the reverse way can therefore have a splendid view of the 6½ miles of docks and shipping.

Reduced Charges.

Mersey Docks and Harbour Board has confirmed a recommendation of the Traffic Committee that the charge for the use of slaughter-houses in connection with oxen and calves landed at the Mersey Cattle Wharf, Birkenhead, after August 2nd, be reduced from 3s. to 2s. per head.

Workington Dock Traffic.

During the 52 weeks ended June 28th, 968 vessels with a registered tonnage of 259,726 were dealt with at the Prince of Wales Dock and Harbour, Workington. Cargoes amounting to 620,515 tons were handled during that period. Of these, 163,000 tons were imported and 457,515 tons were exported.

New Buoys for the Dee.

To the August meeting of the Works and Finance Committee of the River Dee Conservancy Board it was reported that ships' dues and tolls from May 26th, 1930, to July 17th, 1930, were:—Hawarden Bridge, inwards £18 13s. 10d., outwards £89 1s. 10d.; Connah's Quay and Mostyn, inwards £6 6s. 4d., outwards £7; totals, inwards £25 0s. 2d., outwards £96 1s. 10d.; anchorage tolls £8 9s.; total, £129 11s. Below Connah's Quay the course of the low water channel has altered from time to time during the last two months, and at present from the Gap to near No. 9 Buoy the flood and ebb currents are keeping open three channels. A change, however, may be expected, but the existing conditions make the available depth less than it was in May. The repair of the northern training wall has been continued. The total quantity of stone used to date is 2,219 tons and the cost £1,185. The high training bank has been extended to No. 14 Perch, a total distance of 2,616 yards. In accordance with the wishes of the Pilotage Sub-Committee six small buoys have been ordered for the use of pilots.

Another Railway under Mersey.

When the Lord Privy Seal visited Liverpool to attend a conference of representatives of 28 local authorities in Lancashire and Cheshire, Sir Thomas White (Liverpool) made an interesting reference to the desirability of a freight railway being laid in the Mersey Tunnel. He said it was provided in the Act of Parliament that if railways were put through the lower half of the tunnel Liverpool and Birkenhead would have to repay £500,000 to the Road Fund. The only prospect of using that great engineering work to the fullest advantage was by providing railway facilities from one side of the river to the other. That there should be no direct freight railway communication between Liverpool and Birkenhead—the nearest crossing was at Runcorn—was an anachronism that ought to be remedied at the earliest opportunity. It would involve a new Act of Parliament. He asked the assistance of the Lord Privy Seal in the rapid expedition of a Bill through Parliament to overcome the difficulty of putting rails through the lower part of the tunnel and his assistance in getting rid of the £500,000 penalty at present attached to an enterprise which was absolutely necessary for the improvement of rail facilities. Negotiations had been pending for some time and they were endeavouring to induce various authorities to accept, so to speak, the tenancy of the lower portion of the tunnel. It seemed to him that the provision of capital to complete the lower half of the tunnel works and to equip the terminals with the necessary marshalling yards, etc., represented a figure that was likely to kill the scheme so far as the under portion of the tunnel was concerned. A Birkenhead proposal was that there should be a conference between the Cheshire and the Flintshire authorities for an important development regarding transport from the Cheshire side to North Wales. At present it was necessary for traffic to make a detour of thirty miles. A bridge across the Dee would form a very effective link with the Mersey Tunnel and there could be reclamation of land on the foreshore which was at present wasted.

Dock and Town Dues.

Urging that a reduction in dock and town dues on bale and case goods for export is now due, a Liverpool firm of shipping and forwarding agents has taken the initiative in suggesting that approaches should be made to the Mersey Docks and Harbour Board with a view to assisting, if possible, the Lancashire and Yorkshire textile trade. It seems that the dues before the war were rated at 3d. per package and later increased to 6d. per package, which charge has since been reduced by 5 per cent. This high rate has caused much criticism against Liverpool when quoting charges. As the present dues are about 95 per cent. over the pre-war level, a good case can probably be made out for a reduction.

Notes from the North—continued.

Floating Crane for Egypt.

For about nine months workmen employed by Messrs. Cowans, Sheldon and Co., the Carlisle engineering firm, have been busy on the pontoon in the Prince of Wales Dock, Workington, building a huge floating crane for the French Government, to be used for salvage work in the Suez Canal. The crane, which is designed to lift 150 tons, has been tested to 180 tons. Its weight is 1,000 tons, mounted on a pontoon which is 150-ft. long and 63-ft. broad. When the German tug boat " Max Berendt " had to take delivery of the pontoon " La Puissante," the two end sections of the jib were removed and fastened on the deck and the rest of the jib was lowered and securely fastened to the deck of the pontoon with steel cables and girders. The passage through the dock gates required some careful manœuvring, but finally it was safely accomplished with inches to spare, and the pontoon with its load passed out without mishap to begin its 3,000-mile journey to Port Said, Egypt. It is expected that the voyage will take 30 days at an average speed of 4½ miles per hour. The " Max Berendt," which s in the charge of Captain Frahm, is of a registered tonnage of 322. It carries 60 fathoms of towing cable, so the pontoon will sail slowly along, 360-ft. behind. A similar crane which left Workington in May of last year in charge of the tug boat " Atlas," of the same line as the " Max Berendt," parted company with the pontoon during a storm in the Bay of Biscay and pitched into the sea. The pontoon, however, was saved and was towed to Falmouth for repairs.

Two Under-River Tunnels Compared.

Mr. B. H. M. Hewett, M.Inst.C.E., in an address to the Birkenhead Rotary Club on the Mersey Tunnel, dealt with some of the formidable difficulties that had been overcome in the course of the construction of the tunnel. He referred to the general geological similarity of the rock, except at one point on the Birkenhead side, where it differed slightly in water content being somewhat drier, and instanced, by reference to a large scale map, the depth of borings that had taken place and the extreme accuracy of tunnelling from one side to the other, whereby the point of meeting was less than half-an-inch difference. Turning to the question of ventilation, the speaker mentioned that this would be accomplished by ventilating plants n each side of the river and which would be capable of delivering nearly four million cubic feet of fresh air per minute to the tunnel. When fully completed the tunnel would accommodate mechanical traffic at the rate of 3,000 vehicles per hour.

In thanking Mr. Hewett for his remarks, the President, Mr. Joshua Shaw mentioned some interesting comparisons between pumping results on the new tunnel and those obtained on the Mersey Railway. On the invitation of Mr. Hewett, a large number of Rotarians accompanied him on a visit of inspection, which proved to be thoroughly interesting and instructive.

Connah's Quay Wharves.

An agreement has been made between the London and North-Eastern Railway Company, the Dee Conservancy Board and the Flintshire County Council in respect of maintenance of the wharf at Connah's Quay. It is hoped that shipping will increase in volume as the result.

Dee Estuary Scheme.

Concerning the proposals which have been made for the improvement of the Dee Estuary, the Dee Conservancy Board has advised the Flintshire County Council that it is prepared to engage an expert, Mr. Read, at 500 guineas, to report on the schemes for the improvement of the river. Subject to about £200 in a joint fund being available, the balance of something like £300 should be raised in equal proportions by the Conservancy Board and the County Council.

Mersey Training Bank.

The Acting Conservator of the Mersey has received from the Mersey Docks and Harbour Board notice of their intention to raise the highest part of the crest of the existing training bank on the western side of the Crosby Channel generally to a level at, or about, 10-ft. above the Liverpool Bay datum. The Board has also given notice of their intention to construct a training bank on the eastern side of the Crosby channel, beginning east of the black buoy F 4, and continuing in a curved line North and N.E. to a point 480 yards South-west of Crosby beach mark.

Whitehaven Harbour.

The Whitehaven Harbour Commissioners have authorised the payment of interest at the rate of 1½ per cent. per annum for the half-year on Class A bonds. The chairman, Mr. W. Brewster, said they had had a very low export trade during the half-year and had been faced with heavy legal charges.

Caernarvon Harbour Trust.

According to the draft accounts of the Caernarvon Harbour Trust for the financial year there is a surplus of £164 5s. 8d., as compared with a deficit of £1,575 11s. 3d. the previous year. The receipts for the year were £2,376 18s. 11d., which showed a decrease of £320 8s. 4d. on the previous year. The expenditure amounted to £2,212 13s. 3d., as compared with £3,578 10s. 10d. for the previous year, a decrease of £1,365 17s. 7d. The assets of the trust are valued at £26,031.

Death of Dock Board Official.

Mr. John Downes, who has been in the service of the Mersey Docks and Harbour Board for 50 years, died recently at Wallasey. He was 65 years of age. He came to Birkenhead when a youth of 15 and almost immediately entered the service of the Dock Board. From an apprentice he worked himself up in the Dock Board until, at his retirement eighteen months ago, he was chief of the Rates and Dues Department. A year last November he underwent a serious operation in the Sherwood Nursing Home and found himself obliged to retire.

Manx Harbour Works.

Isle of Man Harbour Board, in its annual report, refers to the work in progress on the strengthening of the Red Pier, Douglas, on its southern side. The report says:—The method of construction of the wall of this widening has been the subject of correspondence with the Chief Engineer to the Admiralty, who recommended that it be faced with a granolithic concrete. From the experience gained by observation of the existing pier construction and the effect of vessels on the walling, the Board was strongly of opinion that the wall should be faced with limestone in similar manner to the old structure, the cost of which is estimated to exceed the original estimate for the work by about £4,000. As the Engineer to the Admiralty has now approved the latter proposal (subject to the extra cost being met) the Board has ordered that a limestone facing be put in, and, should it be necessary, application will be made for a further grant to meet the extra cost referred to. With regard to the widening on the north side of the pier, the Harbour Board report that the whole of the sea wall, with the exception of 80 lineal yards of the bull-nose coping course, and a short section at the east end, is completed, and the process of filling in has so far advanced that it has been possible to surface about one third of the whole of the new area sufficiently to utilise it for foot traffic. Rubble is still being deposited in the remaining portion of the widening, because this area is being utilised as the dumping ground for the material which continues to be taken out at the Red Pier, and it is anticipated that this area will be entirely filled in before November 1st next. About half the old pierhead, with the lighthouse, has been removed, and about half the retaining wall across the outer end of the pier has been built; a trench has been sunk across the Fort Anne jetty and the new wall forming the end of the shortened jetty is being built. About 22,500 cubic yards of clay or about one-third of the total quantity was removed in the first month of dredging operations. Rock also has to be dredged and none has yet been removed, but a rock breaker is on the scene of operations. The Harbour Board have become the owners of the Scarlett quarry near Castletown. The Board considers the purchase price will easily be saved by the Board's working the quarry with its own men, instead of allowing the place to get into the hands of private individuals from whom the limestone would have to be purchased at a profit. Scarlett limestone is considered the best obtainable material for protecting piers and quay walls from the chafing of vessels berthed alongside and large quantities will be required for the extensive harbour works which the Board has in contemplation over the next few years. Work which the Board has performed at the minor harbours includes the replacement of a buttress at the Port St. Mary old pier, which new buttress is 2½-ft. wider than the old, at the pierhead; the erection of a reinforced concrete lighthouse at Port Erin, in place of a decaying wooden structure; replacement of timber and steel joists, and of decking, at the Queen's Pier, Ramsey; the removal of 500 or 600 tons of stones and gravel at Laxey, brought down by the heavy floods in the early part of the winter; the placing of a third weir over the Peel River with a reinforced concrete bridge in lieu of an old wooden one, and the rebuilding of the harbour wall at the old pier at Peel. The Isle of Man Harbour Board's lease to the Douglas Steam Ferries, Ltd., expired on March 31st last and a new lease for 14 years was entered into. The company are now to pay as rental 20 per cent. of their takings in fares or £1,000 per annum, whichever sum shall be the greater.

Jugoslavian and Turkish Port Matters.

ACCORDING to the latest statistics tonnage arrived and cleared from Jugoslav ports in 1929 totalled 15,000,000 gross tons with an increase of 1,100,000 gross tons in respect to 1928. Ships entered and cleared Spalato totalled 2,000,000 gross tons, at Ragusa 1,500,000, at Sussak 1,046,000, and at Sebenico 896,000. In 1929 shipping arrived and cleared at Sussak reached 697,000 tons among which there was a large quantity of phosphates, and lumber exports which had grown to 342,000 tons against 276,000 tons in 1928. Shipping at Spalato reached 1,500,000 tons of goods, among which there was a large quantity of coal imported from Great Britain, and cement exported to Egypt and Greece, but it does not look as if things will continue this way. As a matter of fact, the volume of tonnage lying idle is increasing, though Jugoslav ship owners are buying new tonnage, as appears from the recent purchases recently made in the United Kingdom.

Now Jugoslavia is after securing a large volume of trade to their ports, and for this purpose in the course of a meeting which was held at Sussak it has been decided to ask from Belgrade the immediate construction of a railway between Sussak, and Lubljana via Kocevie, Stariborg and Vrbovsko reducing to 224 km. the route between Lubljana and Trieste via Rakek and Postumia, and it is also hoped in such a way to effect the development of trade between Trieste and Austria, and Trieste and Czechoslovakia.

The Turkish Government has taken up the question of the re-organisation of the port of Istamboul, and a committee has been appointed to investigate on the situation of the Turkish ports. The investigations are chiefly to find the reason of the present crisis in the largest Turkish harbour, whether it would be possible to fuse into a single board the various organisations of the harbour, and whether it would be advisable to alter the present harbour charges.

In connection with shipping at Istamboul it should be considered that from the statistics for 1929 which have just been published it appears that during the past year there has been a decrease of small tonnage ships arrived and cleared, and in regard to foreign steamers and motor ships there has not been any change in the number of them between 1928 and 1929, while their net register tonnage has shown in 1929 an increase of 464,484 net register tons in respect to 1928. Among the various countries participating in shipping at this port, Italy takes first place followed by Great Britain, France, Greece and Germany. The tonnage carried with French ships concerns to a great extent Franco-Turkish trade while British ships have carried goods from the various British colonies and dominions.

The coal bunkers made by foreign ships at Istamboul during 1929 reached 217,054 tons as against 170,831 tons in 1928. Turkish coal bunkers represent about one-third of the total, while two-thirds are represented by bunkers of British coals which are imported here. The number of ships which bunkered at Istamboul during 1929 reached about 50 per cent. of the ships arrived and cleared.

The total of goods carried by ships arrived and cleared reached 2,781,901 tons, and among these there were 1,870,822 tons of goods imported and 910,359 tons of goods exported. In connection with the participation of the foreign ports to this trade, 57,137 tons were imported from Antwerp, 42,774 tons from Marseilles, 41,890 tons from Hamburg, 37,352 tons from Trieste, 29,309 tons from Braila, 24,435 tons from New York, 19,446 tons from Amsterdam, 17,480 tons from Montreal (Canada) and 16,162 tons from Buenos Aires. In addition it must be mentioned the active coal trade which has taken place here, and particularly 123,437 tons imported from Mariupol (Russia), 80,198 tons from Cardiff, 15,850 tons from Hull and 10,511 tons from Germany through Rotterdam, while among the imports of oil there have been 81,413 tons from Batum, 35,086 tons from Constanza, 34,177 tons from Novorossisk and 21,125 tons from Suape.

Besides coal and oil, during 1929 the imports in the port of Istamboul included 72,792 tons of maize, 49,157 tons of iron bars, 39,487 tons of sugar, 25,235 tons of cement, 17,847 tons of flour, 15,226 tons of cotton, 13,597 tons of cereals and 9,150 tons of rice. Russia held the first place in this trade followed by Great Britain, Belgium and France.

In connection with the development of exports it should be noted that during 1929 shipments from Istamboul to Italy reached 19,928 tons, to France 12,203 tons, to Greece 9,183 tons, to Great Britain 7,713 tons, to the United States of America 7,543 tons, to Egypt 6,500 tons, to Germany 5,188 tons, to Russia 3,623 tons, to Roumania 2,601 tons, to Syria 2,093 tons, etc. However, the above-mentioned figures cannot be taken as a basis for a judgment of the importance of trade between the various countries as it should not be forgotten that these statistics have been compiled on the basis of the shipments to the various foreign ports, which included also goods in transit to continental countries, or to overseas ports as in the case of Hamburg where goods imported from Turkey are often shipped to the United States of America, or to Central American ports. Among the foreign ports trading with Istamboul there is Marseilles, Trieste, New York, Alexandria, Genoa, Pireaus, Hamburg, Liverpool, Odessa, Naples, London, etc., and the main item of exports is tobacco, but, on the other hand, there are certain goods of which the quantity is not large, but the value very large, such as carpets, silk cocoons, opium, rose oil, etc.

It should not be thought, however, that shipping at Istamboul is confined to trade with foreign ports, as Turkish internal maritime trade is becoming rather active, and it included during 1929, 344,373 tons of coal and 415,049 tons of various goods arrived at Istamboul by sea from Turkish ports among which Zonguldak takes first place with 230,733 tons, followed by Kozlu with 62,452 tons, by Igné-Ada with 38,128 tons, by Rifken with 31,289 tons, by Heraclea with 29,149 tons, by Samsun with 21,849 tons, by Smyrna with 22,611 tons, etc., while shipments from Istamboul included 25,246 tons to Istim, 21,197 tons to Smyrna, 15,132 tons to Panderma, 14,082 tons to Samsun, 12,121 tons to Mersina and 10,768 tons to Trebizonda.

As a matter of fact the Turkish Government is considering the opportunity of increasing the subventions paid to Turkish lines, and it is understood that Turkish shipowners are planning to purchase additional passenger ships.

In connection with the development of shipping at the various Turkish ports, maritime trade at Smyrna during 1929 included 1,982,467 tons of goods, at Trebizonda, 1,565,637 tons, at Zonguldak 1,058,486 tons, at Samsun 989,942 tons, at Inebolu 815,228 tons, at Kerassunda 722,789 tons, at Mersina 703,284 tons, at Ordu 672,038 tons and at Heraclea 502,092 tons.

The Roumanian Government, it is announced, is considering increasing the extension of the free zones in the various Roumanian ports, and negotiations are being carried on to place some warehouses at the disposal of Czechoslovakian sugar exporters in the port of Galatz with a view to increasing the opportunity of securing new markets to this product in the Near East.

In connection with these plans the office for the Danube Navigation in Prague is considering increasing the activities of Czechoslovakian river navigation with Roumania. It should be considered that the Czechoslovakian Government is greatly interested in the development of the port of Bratislava for which it has spent up to the present about 300 millions of Czek-kronen, and which now includes several quays with three large warehouses, ten small hangars, fitted with ten electric cranes, a conveying belt and a grain silo. The result of these efforts has been that shipping at Bratislava has increased from 21,357 tons in 1919 to 467,000 tons in 1928.

Port of St. John, New Brunswick.

The Dominion Department of Public Works has awarded to the Saint John Drydock and Shipbuilding Company a contract for dredging the entrance to the harbour of Saint John, N.B., at a cost of approximately $1,000,000.

The dredging programme will extend over a period of two years and a considerable amount of plant will be brought in to the port. A large number of men will be employed.

The channel leading outwards from the harbour past Partridge Island is to be straightened so that vessels may leave or arrive in greater safety in any weather. The task will involve the cutting away of two sharp bends in the channel.

Contract for East Ferry Road Engineering Works Co., Ltd.

The East Ferry Road Engineering Works Company, Limited, London, E.14, have recently received a contract from the Port of London Authority for a set of hydraulic pressure pumping engines, having a capacity of 350 gallons per minute at a working pressure of 800 lbs. per square inch, with a steam pressure of 145 lbs. per square inch at the engine stop valve, and a speed of 30 revolutions per minute.

The engines are of the horizontal, tandem, compound, condensing type with the steam cylinders in line, each pair actuating two single-acting pump rams. There are two sets of these cylinders and rams, either of which can be laid off at will without interfering with the running of the other.

The interesting point about this contract is that the new plant is to replace a set of engines supplied by this company to the old Millwall Dock Company no less than 44 years ago. It is apparent that in some fields steam, as a prime mover, can at least hold its own and that, notwithstanding the search for novelty, the reciprocating pump still has points of superiority over the rotary types which have been introduced since the old pumps above referred to were installed.

Port of Southampton Topics.

New Docks Extension Proceeding Satisfactorily.

WORK in connection with the new docks extension at Southampton is proceeding so satisfactorily that the time is not far distant when the 3,500-ft. of new quay wall will be an accomplished fact, and Southampton's ability to deal with even more of the world's passenger traffic will be increased to an extent undreamed of a few years ago.

The building of the quay wall, which will eventually extend for a distance of 7,500-ft. along the River Test, is in many ways the most difficult and most important feature of the scheme. Monoliths are being sunk to a considerable depth in the building of the quay wall. Great blocks of concrete, each about the size of a house, are placed one alongside the other to form the wall. The blocks are not solid, but are penetrated from top to bottom by nine shafts, or wells, each about 10-ft. across. These wells enable a grab to pass through the blocks so that the material on which the monolith rests can be grabbed away. As the monoliths sink to a certain depth more monoliths are built above. So the process of sinking and building goes on until the required depth is reached, and the firm stratum, on which the cutting edge of the monolith can rest, is found. The monoliths now being sunk are, so far as a quay wall is concerned, the biggest in the world.

The work of reclaiming about 200 acres of land which is covered by water at high tide, but is wholly bare at low tide, is proceeding apace. The work is being carried out by enclosing the site with earth embankments, the principal embankment being formed of material dredged from the river in the process of forming the new deep water channel.

Dry-docking Facilities at Southampton.

Southampton was very gratified at the announcement made by the Cunard Steamship Company, Limited, that arrangements have been made between the Company and the Board of Trade for the latter to cover such portion of the insurance on the contemplated new liner as cannot be accommodated by the ordinary insurance market.

When built the new mammoth liner will sail in the Cunard express service between Southampton, Cherbourg and New York. From the announcement of the Company it is evident that there are doubts as to the facilities which will be available for dry-docking the new vessel at Southampton. The problem, however, is not as serious as would appear on the surface. The Southern Railway Company (the owners of Southampton Dock) and the Southampton Harbour Board have in the past displayed wonderful foresight, and it is hardly likely that they will let the grass grow under their feet at a time when Southampton is likely to achieve the pinnacle of her fame as a passenger port.

When the White Star Liner " Majestic " (56,621 tons) and the Cunarder " Berengaria " (52,226 tons) made Southampton their home port, and the United States Lines " Leviathan " (59,956 tons) made it her terminal on this side of the Atlantic, the Southern Railway Company were not long in tackling the problem of dry-docking accommodation. At that time the Trafalgar Graving Dock could take the " Berengaria " at a pinch, but there was not an inch too much room, and the idea of getting the " Majestic " or the " Leviathan " into this dock was out of the question. In order to meet the emergency, for it was obvious that any home port of big ships should have dry-docking accommodation for them, the Southern Railway Company ordered from the Tyneside yard of Sir W. G. Armstrong Whitworth and Company, Limited, the giant 60,000 tons floating dock, which since its arrival at Southampton in 1924 has done such excellent service.

The dock was constructed in seven sections, and at the time of delivery from the builders' yard it was stated that, in the event of even greater vessels being built, it would be possible to extend the length of the structure and its lifting capacity by adding one or more sections. Up to the present time this has not been necessary, for the 60,000 tons lifting capacity of the " floater " has never been fully tested. But with the advent of a new ship, to be closely followed in all probability by a sister craft, the problem will require dealing with without delay.

Failing the lengthening of the floating dock it is to be presumed that a great graving dock will have to be included in the huge docks extension scheme now being carried out on the Western Shore. The provision of such a graving dock would be a very expensive undertaking and its great length would only be used for vessels in excess of 60,000 tons, which, even in the future, are likely to be counted on the fingers of one hand.

There is little doubt that the Southern Railway Company will sanction whatever expenditure may be necessary to make Southampton's position as No. 1 passenger port impregnable. The Company have already played a great part in bringing Southampton to her present position. It is true that the townspeople have surrendered certain small advantages and amenities, but this sacrifice is a small matter compared with the millions of pounds sterling which the Company have poured into the port. Without the Railway Company and the Harbour Board, Southampton would be a port of probably only fifth or sixth rate importance.

By embarking on their docks extensions scheme the Company have anticipated the demand which is likely to be made upon the ports facilities in the future. The first section of the work, providing for 3,500-ft. of new deep water quay wall, will be completed by the time the demand for its use materialises, and it would not be surprising to find the second section of the work well in hand, and possibly near completion, by that time.

Southampton will hope to see the new Cunarder bring back to the port the Blue Riband of the Atlantic which the " Muaretania " held for so long. The North German Lloyd liners, " Bremen " and " Europa," are the present holders, and to take the distinction from them the new vessel will have to be capable of a speed of something like 30 knots.

Increases in Traffic Figures for July.

Southampton dock statistics for July show a number of welcome increases over those for the same month last year. The number of vessels inward mounted from 379 to 404, and outward from 386 to 406, whilst the gross and net tonnage totals also showed an appreciable advance. The inward gross tonnage total rose from 1,743,849 to 1,864,567, an increase of 120,718, whilst the outward aggregate advanced from 1,696,021 to 1,880,802 tons, giving a balance of 184,781 tons in favour of July this year. The net tonnage inward increased by 74,917 and outward by 103,859 tons, the respective aggregates being 979,736 inward as against 904,819 and 978,529 outward as compared with 874,670 tons.

In the cargo returns there was a decrease of 4,344 tons inward and 8,836 tons outward. The figures were 56,976 tons against 61,320 tons inward during July, 1929, and 37,448 tons as compared with 46,324 tons outward. The passenger returns again revealed an increase, the total inward leaping from 38,361 to 40,124, and outward from 43,842 to 46,674, giving increases of 1,763 inward and 2,832 outward.

P. and O. Company and Southampton.

Southampton never lost its interest in the P. and O. Company, even though for a time the vessels were not seen at the docks, except when they came as transports. In recent years, however, the connection has been developed, and the port is now included in the activities of the company on a number of its routes. Passengers as well as cargo are embarked here for India and the Far East, and in August of next year the first of two new ships will be added to the service from London and Southampton to the Straits, China, and Japan. The second is expected to make her appearance in October following. These two ships are to be built by Alexander Stephen and Sons, Limited, of Glasgow, and will be of about 14,000 tons.

Busy Day at Southampton.

August 23rd, one of the busiest days in Southampton Docks during the present season, marked the peak period of the Atlantic traffic, and with vessels on other routes landing or embarking passengers, the dock and shipping officials were kept working at full pressure.

During the day there was a constant stream of trains from London bearing passengers for the mail liners. The traffic manager's staff had to deal with 16 special trains from the metropolis, and in addition there was a pressure of traffic from the docks, so that by the time the last cross-Channel vessel had been dealt with nearly 30 special trains were received in, or despatched from, the docks in a period of about 14 hours.

There were nine departures by ocean-going ships on regular mail services, and in addition the " Homeric," of the White Star Line, and the " Aquitania," of the Cunard Line, were inward bound from the States, and the " Pieter C. Hooft," of the Nederland Royal Mail Line, arrived from Batavia. An extra sailing was that of the " American Farmer," which, having been repaired at Southampton, left with passengers for America. The cross-Channel traffic was also very heavy.

During the day ten ships sailed for New York or Canada, and in every case accommodation was severely taxed, especially in regard to the tourist third class. By the time the vessels had made their final Channel calls there was practically no berth left unoccupied, and it is safe to say that when the ships reach their port of destination, there will be approximately 10,000 passengers to be landed.

Some idea of the extent of the Atlantic traffic may be gathered from the figures of the various ships. The White Star Liner " Megantic," bound for Canada had about 1,000 passengers, and the " Lapland," of the Red Star Line, which arrived with

Port of Southampton Topics—continued.

a large number of passengers who had joined her on the Continent, had about a thousand on board by the time she had taken 150 at Southampton, and had " filled up " at Cherbourg.

The Cunard Line had to deal with three outward vessels, two being bound for New York, and one for Canada, and the embarkations at Southampton reached very high totals. The " Mauretania's " list, including those due to join the vessel at Cherbourg, was 1,270. The " Tuscania " had a total of just under a thousand, and the " Ausonia," engaged in the Canadian trade, had 650 passengers.

Among the calling vessels was the North German Liner " Europa," whose total for New York from the European ports was approximately 2,000, of whom 350 booked via Southampton. " The Empress of Australia," bound for Canada, had 880 on board. The Hamburg America Liner, " Deutschland," after landing over 60 passengers from Germany, embarked for New York, nearly 90 travellers, her aggregate for New York being about 1,000.

The Holland-America Line, who have been setting up record figures for their embarkations at Southampton recently, had a full ship in the " Nieuw Amsterdam."

Trooping Season Commences Shortly at Southampton.

The trooping season, which means much to Southampton, begins early in September, and within the next few weeks several transports will take up their berths in the Empress Dock. The " Nevasa " and " Neuralia " have been lying off Netley during the Summer, and they, like the " Somersetshire " and the " Dorsetshire," which have been laid up at Dartmouth, have been receiving the customary attention before entering on their months of service. Each has been in dry dock, undergoing overhaul. The Bibby Line vessel " Lancashire " will this year take the place in the trooping fleet of the Ellerman Liner, the " City of Marseilles," which has now been returned to her owners, and is once more engaged in the passenger and cargo business for which she was intended.

Ceylon and Indian Notes.

Balance Sheet of Ceylon Port Commission.

THE notion that the Port of Colombo is a gold mine to Ceylon is effectively shattered by the balance sheet of the Port Commission. In round figures the total debt of the port to the general revenue is seven million rupees as could well be seen from the report of the Chairman of the Colombo Port Commission for 1929.

The trade—imports and exports—of the Port of Colombo dealt with in 1929, according to the report, amounted to 2,054,002 tons (1,250,860 tons imports and 803,142 tons exports), as compared with 1,932,803 tons (1,200,374 tons imports and 732,429 tons exports) handled in 1928. There has been an appreciable increase in the trade of the port, as compared with that of the preceding year, a satisfactory result in view of the depression in the tea, rubber and copra markets.

A detailed investigation of the Port Commission accounts was made during the year by a committee of the commission appointed for the purpose. As a result of this investigation, credit is taken in the accounts for the year under review for certain items of revenue not hitherto taken into account, whilst on the expenditure side certain items hitherto charged are now included. The revenue for the financial year 1928-29 on this basis is Rs. 6,502,095-39, an increase of Rs. 547,093-57 over the revenue shown for 1927-28. Of this increase of roughly 5½ lakhs, approximately 2½ lakhs is accounted for by items of revenue not previously taken into account. The expenditure on revenue account is Rs. 3,391,547-62, which is less by Rs. 64,629-23 than the figure of expenditure shown for the previous year.

The statement of capital expenditure published in the Annual Administration Report was scrutinized by the committee, and, as a result the total capital expenditure, as at the end of 1927-28, now appears as Rs. 62,476,781 instead of Rs. 57,314,247, as given in the Administration Report of that year. The increase is due to certain items of capital expenditure in the early days of the construction of the harbour, hitherto not taken into account. During the year under review there was a further capital expenditure of Rs. 1,272,896, Rs. 1,178,965 of this being provided from revenue and Rs. 93,931 from loan funds. This brings the total capital expenditure at the end of 1928-29 to Rs. 63,749,677. This figure does not represent the present capital value of the harbour works, but merely the aggregate of all expenditure upon such works deemed to be of a capital nature.

The Lean Years.

Setting against the total revenue derived from the harbour each year, the expenditure from the general revenue upon the harbour, together with interest and sinking fund charges upon loan expenditure, it would appear that from 1883 to 1889 there was an accumulated surplus, from 1890 to 1899 an accumulated deficit, from 1900 to 1916-17 an accumulated surplus, and from 1917-18 to the end of 1927-28 an accumulated deficit. Crediting to Government interest on the accumulated deficits and crediting to the port revenue interest upon accumulated surpluses at the rates of interest prevailing in each year, the net result shows an excess of expenditure from general revenue upon the harbour over the revenue derived from the harbour, amounting to Rs. 6,847,254. The debt of the port to general revenue at the end of 1927-28 is thus Rs. 6,847,254 in addition to the balance outstanding on loan account. Interest and sinking fund upon expenditure from loan funds prior to 1883 have not been taken into account, as it was decided in that year that in view of the great benefit to the Island of the establishment of a major port at Colombo, the interest and sinking fund upon loan funds expended during the period of construction of the breakwater and prior to the imposition of the new port dues and charges should be met from general revenue, and should not be charged against the harbour fund.

Debt of Seven Million.

For the year 1928-29 the balance of revenue over expenditure on maintenance account of the harbour was Rs. 3,110,547-77. To arrive at the net result of the year's working, there must be deducted from this balance the sum of Rs. 1,178,965 expended from the revenue of the Colony upon harbour works of a capital nature, Rs. 1,785,502-94 being interest and sinking fund on the total loan funds expended and a further sum of Rs. 268,918-10 being interest at 5 per cent. on the accumulated deficit at the end of 1927-28 referred to above—a total of Rs. 3,228,386-04. The net result of the working of the port for the year under review is, therefore, a further charge upon the general revenue of the colony of Rs. 117,838-27. This brings the total debt of the port to general revenue, exclusive of the outstanding balance on loan account, to approximately Rs. 7,000,000.

Foreign Trade of India.

Total imports of merchandise into India shows a decline in value to Rs. 240¾ crores from Rs. 253¼ crores in the last year. Imports from the United Kingdom suffered a decline from Rs. 113 crores to Rs. 103 crores, and the percentage of the total trade was reduced from 44.7 to 42.8. This fall in the share of the United Kingdom is mainly due to the reductions under the following main headings amounting to: (1) Coloured, printed and dyed piece goods, Rs. 249 lakhs; (2) bleached piece goods, Rs. 221 lakhs; (3) unbleached piece goods, Rs. 203 lakhs; (4) galvanised steel sheets, Rs. 189 lakhs; (5) cotton yarns, Rs. 60 lakhs; (6) artificial silk and cotton mixtures, Rs. 43 lakhs; (7) machinery, Rs. 41 lakhs; and (8) woollen piece goods, Rs. 31 lakhs. German shipments fell very slightly from Rs. 1,584 lakhs to Rs. 1,582 lakhs, while the German percentage of the total trade actually increased from 6.3 to 6.6. The share of the United States fell from 6.9 per cent. to 6.7 per cent., and that of Italy was also reduced from 2.9 to 2.8 per cent.

The outstanding feature of the returns is the remarkable increase in imports from Japan, from 1,767 lakhs of rupees to Rs. 2,359 lakhs and the percentage share from 7 to 9.8. This remarkable advance in Japan's trade with India during the year is almost entirely accounted for by the textile headings, the increase in Japan's shipments amounting to: (1) Unbleached piece goods, Rs. 290 lakhs; (2) cotton and artificial silk mixtures, Rs. 110 lakhs; (3) coloured, printed and dyed piece goods, Rs. 73 lakhs; (4) cotton yarns, Rs. 40 lakhs; (5) bleached piece goods, Rs. 18 lakhs.

Case Against U.S. Shipping Company.

The Rubber and Produce Traders (Ceylon), Limited, of Colombo, has instituted an action in the Colombo District Court sueing (1) the United States Shipping Board Merchant Fleet Corporation of Washington and (2) the Roosevelt Steamship Company Incorporated of New York for the recovery of a sum of Rs. 3,586-83 cents being damages for alleged breach of contract. The plaintiffs allege that the first and second defendants are the owners of certain vessels trading between India and Ceylon and the United States of America. The vessels are referred to by the defendant as the American India Line and are known as such in the trade. On March, 1928, Messrs.

Ceylon and Indian Notes—continued.

Lionel Edwards, Ltd., of Colombo, acting as agents for the defendants agreed (inter alia) to carry from Colombo, acting as agents for the defendants agreed (inter alia) to carry from Colombo to New York for plaintiff company 50 tons of rubber monthly from the month of April, 1928, to December of the same year, in consideration of the plaintiff company paying freight at the rate of 25s. per ton of rubber. On April of the same year the agents repudiated the contract and refused to accept cargo for shipment at contract rate, and by reason of the breach of the contract the plaintiff company has suffered loss and damages amounting to the above figures which they now claim from the defendants.

Mr. N. K. Chosky filed defendants' proxy and Powers of Attorney and moved for time to file and swear and the judge allowed the application till October 22nd.

Customs Revenue for June.

The following are the details of the Customs Revenue collected in Ceylon in June last: Cotton manufactures, Rs. 69,961-25; grain, Rs. 976,019-66; kerosene oil and motor spirits, Rs. 556,800-91; spirits and cordials, Rs. 173,057-25; sugar, Rs. 429,727-67; other goods, Rs. 1,007,290-44; cocoa, Rs. 4,512-14; cocoanut (dessicated), Rs. 33,981-51; cocoanuts (fresh), Rs. 2,824-11; cocoanut oil, Rs. 44,003-11; copra, Rs. 72,970-35; poonac, Rs. 3,224-99; rubber, Rs. 151,277-78; tea, Rs. 689,971-02; and sundries, Rs. 10,332-30. Total import duties, Rs. 3,212,857-18; total export duties, Rs. 1,013,097-31. —Grand total, Rs. 4,225,954-49 cents.

Ceylon's Foreign Trade during June.

According to the Customs Returns for June, just issued, imports have increased in value by Rs. 596,689 as compared with the month of May. But they still fall short of the figure for February which was the lowest for some years. Domestic exports have fallen by Rs. 1,222,968 in June as compared with the previous month, and the value is the lowest since January this year. For the first six months of 1930, the total value of imports shows a decrease of Rs. 1,120,972 as compared with the same period in 1929, and of Rs. 38,948,604 as compared with the first half of 1928. Exports from January to June this year shows a decrease of Rs. 39,822,958 in value as compared with the first six months of 1929. Compared with the same period in 1928, the decrease is only Rs. 11,359,846. The Customs Revenue (from import and export duties) for the first six months of this year shows a decrease of Rs. 1,120,992 as compared with the corresponding period of last year.

General.

It is learnt that the Lloyd Royal Belge S.A., Antwerp, one of the most important Belgian shipping concerns, will in future arrange for their round-the-world vessels to call at Colombo on their way to the Far East and the Pacific Coast of North America. The service is a monthly one and the vessels start from Antwerp. The route taken is via the Suez Canal to the Far East and thence to the Pacific Coast of North America and back to Antwerp via the Panama Canal. Now all cargo from Colombo destined for the Pacific Coast has to be transhipped at Hong-Kong, and, as a matter of fact, the Belgian Company is the first shipping concern offering Colombo shippers direct shipping opportunities to the Pacific Coast.

The new launch, for towing mooring boats in the Colombo harbour, the construction of which was undertaken recently, has been completed by the Harbour Engineer's Department and will shortly be handed over to the Master Attendant.

The Standard Oil Company of New York has taken on lease a plot of land at Blomendhal, adjoining the Colombo Port, in connection with their proposed fuel oil business. It cost the company Rs. 3,000 per annum, the Port Commission refusing to lease it at a lesser amount.

Rumours prevalent for some time that there was likely to be a marked advance in freight rates on Australian inward cargoes have perceptibly hardened during the last few weeks. Owing to the action of Mr. Scullin's " super-tariff " measure, it is pointed out that if Australia is to continue to enjoy even a semblance of her old-time shipping facilities, there will have to be a material rise in the existing rates. A curious situation is thus developing. Tea exporters are asking whether vessels from Europe calling at Colombo, and with " unlimited cargo space " empty will not demand a higher freight on tea for the Australian market.

The Colombo Port Commission has increased the oil maintenance charge to 55 cents a ton as from August 1st, 1930.

The Port of Manchester.

The traffic receipts for the half-year ended 30th June, 1930, amounted to £683,809 as compared with £745,169 for the corresponding period of last year, a decrease of £61,360. The net revenue of the whole of the undertaking for the half-year (after providing for interest and fixed charges) was £36,498 less than the corresponding half-year in 1929. The result reflects the reductions in charges (made largely in consequence of the derating scheme embodied in the Local Government Act, 1928) which operated during the whole of the half-year. It was also adversely affected by the strike at the Manchester Docks in April last.

The approximate returns for July show traffic receipts amounting to £108,072 against £113,173 in the corresponding month of the previous year, a decrease of £5,101, less than half the average monthly decrease over the half-year ending with June last.

July, as the foregoing figures show, was an improvement on previous months and not unsatisfactory taking into account the present state of trade and the general depression prevailing in Lancashire's staple industry and bearing in mind the reduction in charges already referred to. Nineteen more vessels entered the port during the month than in the previous July, the increase in the aggregate net register being roundly 17,000 tons.

Arrivals from America were good, eighteen steamers entering the port with general cargo during the month.

Grain came forward well and the prospects are good.

Oil and timber imports were above the average. Thirteen full cargoes of timber entered. So far this traffic has been an improvement on last year and there is no slackening in inward shipments.

The Pacific coast trade, upon which two regular lines are engaged, has been maintained. The prospect of a third, the Pacific-Atlantic Line, entering this service with Manchester as a port of call has been referred to in the press recently. The first sailing is now scheduled, from the American side, for next month.

The heaviest paper cargoes have been from Newfoundland, but Norway, Sweden and Canada have contributed to the total imports.

The iron ore traffic has been active, five full cargoes arrived in the period and there are others on passage.

Cargoes of pulp wood from Leningrad entered during the month and outward cargoes to Russia included machinery from Metropolitan-Vickers, in Trafford Park.

Heavy shipments of rolling stock have taken place from the port during the month; the " Beldis " loading locomotives and tenders for the Bombay-Baroda Central India Railways and the " Belpamela " railway coaches for the Buenos Aires Central Railway. The locomotives were from the Vulcan Foundry, Newton-le-Willows, and the railway coaches from the Metropolitan Carriage and Waggon Company's Nottingham works. Further shipments of rolling stock will take place in September.

As will have been anticipated, the United Kingdom importation of cotton during the season ending on the 31st of July last shows some decline. While Manchester has not escaped a reduction in the volume of imported cotton, the port has received an increased proportion of the total imports of American, Egyptian and Indian growths. The proportion of American imports this past season stands higher than in any previous season since the opening of the port.

The imports of Indian cotton during the season just closed doubled those for the season 1928-29.

A party of delegates from the Mississippi Valley Association, making a tour of European waterways, visited the Manchester Docks during the month and inspected a section of the Ship Canal.

Port of Halifax, Nova Scotia.

The proposed bridge spanning the harbour between Halifax and Dartmouth, Nova Scotia, is estimated to cost $2,405,300, exclusive of land, legal and organisation expenses. The figure named contemplates the construction of a suspension bridge and an alternative estimate of $2,547,480 has been made for a cantilever bridge at the same location. The construction of the bridge would obviate the necessity of transporting passengers and freight by ferry, the existing alternative route being a 15-mile highway around the harbour.

Irish Harbour Matters.

Development of the Port of Cork.

MR. J. N. MULLAN, Executive Vice-President of the Ireland Corporation of America, has submitted a new proposal for the development of the Port of Cork as a trade distribution centre for Europe, to the Cork Harbour Board, but it does not seem likely that the scheme will be adopted. The proposal is based on an assumed increase of revenues of more than £80,000, which includes the leasing of 40 acres of reclaimed land at £400 per acre per annum. The proposed development would be on the line that, in consideration of the Cork Harbour Board expending a sum not exceeding 400 dollars, the Ireland Corporation should spend a similar amount in making necessary borings at Cuskinny, provided they are given an option to construct a deep water quay and create an area of 30 to 40 acres of land alongside. Plans would then be submitted to the Board provided the estimated cost did not exceed six million dollars, the amount required being raised on bond issue.

In submitting his proposal Mr. Mullan stated that not only would the Cork Harbour Board be assured of the support of Transatlantic shipping lines, but there was a possibility of more than one American firm setting up factories at Cuskinny if the necessary shipping facilities were available. "Cork Harbour is a natural place for this development," he said, "and if you and your government want industries, here is your opportunity."

Mr. John J. Horgan, one of the leading members of the Board, said that the proposal meant that in consideration for the expenditure on borings by the Ireland Corporation of America, they would have to hand over their birthright in the port on such terms that Mr. Mullan and his friends might dictate in its administration hereafter. They should not time themselves to a fantastic project that, so far, held no material advantages.

Meanwhile Mr. Mullan has denied any intention on the part of the Ireland Corporation of America to interfere with the birthright of the Cork Harbour Commissioners or their administration of the harbour.

The Cunard Co. and Galway as a Port of Call.

From the New York offices of the Cunard Co., a circular has been issued to United States agents of the company pointing out that "Galway is now established as a Cunard port of call" and that "due to the insistent demand on the part of our agents for space in steamers calling at Galway, the Cunard Line is pleased to announce the following additional calls at that port: August 25th, "Laconia," from New York, calling at Galway, Queenstown and Liverpool; October 18th, "Laconia," sailing to Galway, Queenstown and Liverpool." There will also be the following calls to Galway from New York and Boston: "Suthie," sail Saturday August 9th and September 6th; "Laconia," sailing December 13th with a Christmas excursion party.

Free State Ports and Harbours Tribunal.

Although the report of the Irish Free State Ports and Harbours Tribunal has not yet been published, it is understood that one of the recommendations will be that all ports and harbours in the Irish Free State shall come under the control of the Department of Industry and Commerce. There is a recommendation that ports and harbours be divided into two classes, the first to include Dublin, Cork, Limerick, Waterford and Galway. Each will be controlled by a governing body, representing the local Corporation, Chambers of Commerce, shipping interests and the Department of Industry and Commerce. In the case of Dublin, Cork, Limerick and Waterford, it is suggested that a manager should be appointed.

There is no proposal to make Dublin a free port, to transfer the mail facilities from Kingstown to Dublin, or to set up a seaplane base at Kingstown.

In the case of Dublin, Cork, Limerick and Waterford, it is recommended that a manager, acting under the governing body shall be appointed to look after the routine administration.

It is also recommended that greater uniformity should be secured in tonnage rates.

The Tribunal consisted of Mr. H. B. O'Hanlon, Solicitor, Chairman; Mr. C. H. O'Conor and Mr. M. Deegan, with Mr. Henry Baxter as Secretary.

The terms of reference were to enquire into the present position of the following harbours, etc.: Annagasson, Co. Louth, Arklow, Ballyshannon, Baltimore and Skibbereen, Co. Cork, Dingle, Co. Kerry, Drogheda, Dublin, Dundalk, Foynes, Galway, Killybegs, Kilrush, Kinsale, Limerick, Moy River, New Ross, Sligo, Waterford, Tralee, Wexford, Wicklow, Youghal, with special reference to the constitution, powers and methods of administration of their respective authorities; the charging powers and financial position of such authorities; the facilities provided for trade and commerce and the extent to which such trade is done in ships owned in the Irish Free State; the present statute law relating to such ports, and any charges which appear desirable in order to promote the trade and commerce of the Irish Free State.

The Tribunal has spent about eighteen months taking evidence, its first sittings being held at Ballyshannon, Co. Donegal in October, 1926.

Launch of Sligo Steamer at Dublin.

On the 30th July, there was launched in the yards of the Dublin Dockyard Co. (Vickers, Ireland), Ltd., the twin-screw steamer "Sligo," for the Sligo Steam Navigation Co., Ltd. The naming ceremony was performed by Miss Jackson, daughter of Mr. A. Jackson, Chairman and Managing Director of the Sligo Steam Navigation Co. The new vessel is intended for the Sligo and Liverpool trade of the company, which is extensive.

At the informal luncheon held in the works canteen after the launch, Senator Jas. Moran, Vice-Chairman, Vickers (Ireland), Limited, who presided, thanked Miss Jackson for taking part in the naming ceremony.

The "Sligo" measures 231-ft. overall; breadth moulded 38-ft.; depth moulded to main deck 16-ft. 3-in.

The vessel is constructed of mild steel under special survey of Lloyd's Register to comply with their requirements of 100 A.1. She also conforms to the Board of Trade requirements and to the cattle-carrying requirements of the Department of Agriculture. She is of the shelter deck type with machinery fitted amidships, and has large holds.

The vessel has a cellular double bottom for water ballast and also large fore and aft peak ballast tanks, enabling her to travel well when light. The cattle pens are modern and provide accommodation for 275 fat cattle. There is also provision for carrying 500 sheep on the upper deck. In addition to ordinary cargo holds, refrigerated chambers are fitted for dairy produce.

There is excellent accommodation for the officers and crew. The vessel is completely lighted by electricity and carries a searchlight for use in the river.

Rigged as a two-masted fore and aft steamer, the "Sligo" has an unusually good outfit, including steam windlass, powerful steam winches for quick handling of cargo, large steam capstan for working the stern moorings, and steering gear of the Wilson-Perrie Telemotor type. The vessel will be fitted with two sets of triple expansion engines, with steam supplied from two large boilers. This will be installed by Messrs. McKie and Baxter, Glasgow. The vessel was built to the designs of Messrs. Jas. Maxton and Co., and under the personal superintendence of Mr. W. J. Press. Before the construction started, tank trials were made by Messrs. Vickers' experimental works, St. Albans.

Kiel Canal Traffic for the First Half-year of 1930.

A report received by the Department of Overseas Trade from the Acting British Consul General at Hamburg states that, compared with the corresponding period of 1929, traffic through the Kiel Canal showed an increase of some 6,000 vessels and an aggregate of approximately 2,400,000 net registered tons, the figures being as follows:—

		No. of Vessels.	Net Reg. Tons.
Jan.-June, 1930	...	23,938	9,987,499
Jan.-June, 1929	...	17,982	7,561,443

This is partly accounted for by the fact that between January and March, of 1929, traffic through the canal was affected by the prevailing ice conditions.

Of the 23,938 vessels passing through the canal during the first six months of 1930, 11,979 vessels, aggregating 9,038,355 net registered tons, were registered as sea-going steamers. These included: 11,236 freight and passenger vessels of 9,000,823 n.r.t.; 668 steam tugs of 27,463 n.r.t.; 13 fishing steamers of 1,654 n.r.t.

Further, 10,113 sailing vessels of 536,414 n.r.t.; 776 lighters and barges of 236,353 n.r.t.; and 1,005 pleasure and Government vessels of 176,389 n.r.t.

The vessels were loaded as follows: 84 with passengers, 169 with cattle, 979 with coal, 331 with stone, 347 with iron, 1,879 with timber, 2,657 with grain, 197 with ore, 3,953 with other bulk goods, 5,740 with general cargo, 554 with miscellaneous cargo, and 7,149 empty or in ballast.

Personal enquiries regarding shipping and transport matters should be made at the City Office of the Department (Shipping and Transport Section), 73, Basinghall Street, London, E.C.2.

Italian Harbour Affairs.

ACCORDING to the statistics which have just been published by the Istituto Centrale di Statistica shipping at Italian ports during the period from January to June, 1930, was as follows:—

	No.	N.R.T.	Goods (Tons).
ARRIVALS.			
1930	121,199	38,843,720	13,990,768
1929	115,823	37,485,570	14,395,236
CLEARANCES.			
1930	121,084	38,870,242	4,665,376
1929	117,775	37,271,486	4,799,637
TOTAL.			
1930	242,283	77,713,962	18,656,144
1929	251,598	74,757,056	19,194,873

From these figures it appears (1) that the number of ships arrived and cleared, and their net register tonnage is showing an advance; (2) that goods imported have shown a decline of 600,000 tons, and goods exported a decline of 100,000 tons, and this is due particularly to the depression of exports by sailing vessels which are generally handling coastwise trade. The difference between the net register tonnage of ships arrived and cleared and the volume of goods handled can easily be explained when it is considered that the great number of large liners calling at Italian ports are on pleasure cruises. It should be noted that Italian ships leaving for overseas markets have carried this year a larger volume of goods than during the corresponding period of 1929. Such results have not affected all the Italian ports in the same way, as imports have also shown an increase at Civitavecchia, Brindisi and Fiume, while exports have shown progress at Savona, Leghorn, Naples, Ancona, Venice, Fiume, Messina, Catania, Palermo, and Cagliari, as the following figures show:—

	Goods Arrived.		Goods Shipped.	
	1930	1929	1930	1929
	JANUARY-JUNE			
	Tons	Tons	Tons	Tons
Savona	857,293	888,350	123,082	44,429
Genova	3,121,820	3,591,970	454,084	517,119
Leghorn	798,922	811,233	219,921	180,949
Civitavecchia ...	556,350	464,693	38,903	62,446
Naples	903,752	1,011,770	166,496	156,791
Brindisi	49,877	29,943	7,541	6,308
Bari	160,552	173,386	32,340	39,036
Ancona	351,387	267,057	30,579	38,376
Venezia	1,178,804	1,215,143	226,843	196,609
Trieste	826,062	1,030,922	410,015	432,984
Fiume	241,270	238,962	166,636	165,091
Messina	189,474	191,602	67,390	52,157
Catania	217,934	241,823	91,934	90,473
Siracusa	40,343	44,793	25,282	33,048
Palermo	315,474	317,063	†99,930	82,559
Cagliari	127,046	132,414	134,416	126,106

In order, however, to better understand the development of trade at the various Italian ports it is advisable to take into consideration the development of the most important goods unloaded at the chief Italian ports, and which are given in the following table:—

	Coal		Cereals		Cotton	
	1930	1929	1930	1929	1930	1929
	Tons	Tons	Tons	Tons	Tons	Tons
Genova ...	1,368,770	1,449,610	448,691	691,201	81,772	102,229
Savona ...	746,138	778,056	9,295	—	—	—
Leghorn ...	469,932	535,647	65,504	68,427	1,558	1,549
Civitavecchia	394,991	290,500	41,049	55,870	146	399
Naples ...	346,862	497,066	159,565	285,717	6,251	4,971
Palermo ...	183,086	147,236	11,516	24,472	—	—
Catania ...	64,052	79,213	31,863	47,864	—	—
Trieste* ...	195,582	201,434	1,937	56,074	22,337	28,508
Fiume ...	37,695	32,521	679	1,304	63	150
Venezia ...	659,125	572,834	91,525	191,446	26,298	23,289
Ancona ...	222,789	160,689	18,083	20,809	25	122
Bari ...	59,627	67,007	12,935	48,290	—	—

* For the period January-April, 1930 and 1929 only.

It will be noticed that there is a large decrease in cereals imported, but the coal trade has not been as bad as it would seem, though on the other hand it should be considered that in the case of Trieste the decrease of the cereals trade is the result of the reduced purchases made by the countries of Central Europe, and to the fact that large quantities of cereals have been bought recently in Roumania. On the other hand the progress of the cotton imports is noteworthy, particularly taking into consideration that a certain portion of the textile industry which used to buy through Venice has now turned their activities towards the Port of Genoa.

Whether shipping is to increase or to decrease it is difficult to say, but much will depend from the course, of the foreign trade, and the second part of 1930 may show some alterations to the following developments:—

Imports.		January-May. 1930	1929
Coffee ...	Centals	195,740	201,234
Sugar ...	,,	54,990	111,283
Wheat ...	Tons	603,921	1,119,987
Oilseeds ...	Centals	506,437	1,519,889
Cotton ...	,,	1,097,913	1,138,093
Wools ...	,,	250,971	316,782
Coals ...	Tons	4,323,271	4,332,432

In connection with trade at Genoa, the Consorzio Autonomo del Porto has taken up the question of the increase in trade, and a project is being considered for the creation of special railway tariffs to be applied to shipments exported through the port of Genoa. Particular attention is being paid to the organisation of operations in the various sections of the port, and thanks to the inauguration of the warehouses in the Molo Caracciolo and on the Passe Nuovo, where the export trade has been concentrated, over 20,000 sq. metres of warehouses have been left free on the Ponte Parodi, Ponte Doria, Calata S. Lazzarino, and Ponte Colombo. The Consorzio Autonomo del Porto di Genova has taken into consideration the efforts, which are being made by the Navigazione Libera Triestina, to increase shipping, particularly with the North Pacific Coast, with West and South Africa, and has placed at the disposal of this company one of the two warehouses left free at the Ponte Colombo where the N.L.T. can now concentrate all its traffic. Furthermore, special attention has been paid to the shipment of unpacked automobiles and milled rice to North Europe and to the Levant which has been concentrated on the place left free at the Calata San Lazzarino, and hereafter shipments will be made directly from railway cars to ships lying alongside the quay thus reducing the cost. But this is not all the activity recently developed by the Consorzio Autonomo, as it has also granted permission to build palm oil tanks on the head of the Ponte Paleocapa to the Società Anonima "Africane Riunite," while in view of the fact that wool is imported by liners also carrying other goods, the Instituto Italiano Laniero, which is operating the wool warehouse on the Ponte Assereto, has been authorised to store in such warehouse other goods also in order to avoid ships having to change space or lighters being used. In order to improve the commercial side of the railway traffic it has been decided to establish better connections between the Consorzio and the State Railways Administration.

The fire extinguishing ship, "Santa Barbara," built to the order of the Consorzio Autonomo del Porto, at the Contiere Federale di Pietra Ligure has just undertaken her trials which have been fully satisfactory. Her chief dimensions are as follows: 27.50 metres in length, 3.20 metres in height of construction, 5.20 metres in breadth with a displacement of 150 tons. The propelling machinery consists of two Fiat Diesel engines with six cylinders of a power of 450 h.p. The propelling machinery controls four pumps of a capacity of 6,000 litres per minute. The cost of this ship was 2 million lire.

A decree has been issued by the Provveditorato del Porto viewing the creation of a special warehouse in the San Basilio Quay at the disposal of the S.A. Sucrerie et Rafinerie de Pontelongo represented in Venice by the Società Veneta per l'Esercizio dei Magazzini Generali e Spedizioni di Venezia. The Provveditorato del Porto has taken into consideration the opportunity of increasing the wool trade through Venice in order to supply the various wool mills existing in the district.

According to a statement which has just been issued to the press the Azienda dei Magazzini Generali di Fiume has decided to grant special premiums on lumber shipments from the Balkans to overseas ports through Fiume. This decision assumes a considerable importance taking into consideration that several liners of the Cunard-Anchor Line, of the Ellerman Wilson Line, of the Klg. Nederland Stoomboot Mijs were forced to wait for days on the open seas to find a place in the port of Sussak where, owing to the depreciation of the dinar operations were cheaper than at Fiume, while the concession of premiums re-establishes the situation in favour of Fiume, where there are extensive quayage facilities.

The maritime passenger station has been opened at Syracusa, Sicily, the construction of which was started in 1927. The building is 45 metres in length and 21 in breadth, and it includes a large hall, a first and second-class waiting room and a third-class waiting room, restaurants, offices, etc. The building, which has the main entrance on the waterfront, is built in concrete. It should be taken into consideration that Syracusa has an active passenger trade with Malta, Egypt and Lybia, and practically all the steamers calling at that port connect up with a train de luxe between Rome, Naples and Syracusa.

Italian Harbour Affairs—continued.

The Ministry for the Communications have published a decree according to which the collection of a 10 centesimi tax on each ton of goods unloaded and loaded at Bari, Brindisi, Molfetta, Barletta and Taranto shall be started on December 31st, 1930.

H. E. Bottai, the Italian Minister for the Corporations, has visited Trieste, where he has had meetings with the leading business people, and inspected the various quays, warehouses, etc. Signor Bottai has declared that he will take into consideration the steps to be taken in favour of Trieste, to increase transit trade from Central Europe. In the meantime, however, it is announced that Egypt is raising import duties on sugar and it should be taken into consideration that sugar represented one of the main items of transit trade from Czechoslovakia and Hungary, through Trieste, so that it may be expected that the decision of the Egyptian Government is to influence the development of Trieste shipping.

Scottish Harbour Notes.

Loan for Wick Harbour.

INTIMATION was made at a recent meeting of Wick Harbour Trustees that the Scottish Fishery Board had offered a grant of £8,000 for part of the local harbour reconditioning scheme. Previously the Harbour Trustees had agreed to accept a loan of £22,463 to be devoted to continuing extension work left unfinished since before the war, but this grant, however, is for totally different work. The existing harbour is greatly deteriorating and it is estimated that between £20,000 and £30,000 will have to be spent on the reconditioning work. It is likely that £6,000 of the new grant will be used for steel piling in the Inner Harbour while, £2,000 will be used for strengthening the north pierhead. It is stipulated that the money must be expended by the month of March next, and the Harbour Trustees accepted the grant on this condition.

Sand Accumulation at Eyemouth.

At Eyemouth much concern has been created by a huge sandbank which has accumulated at the local harbour as a result of high seas. Extensive dredging operations have been carried out over the very spot where the sand has again been thrown up, and the whole of this dredging work has therefore been undone. It is understood, however, that the Local Harbour Commissioners have now a scheme on hand for the extension of the pier which should permit of fish being landed at low water, and—if this scheme is entered upon—it is hoped that this will remove the possibility of sand being driven into the harbour on account of its altered construction.

Contracts Placed for Glasgow Harbour.

Clyde Navigation Trustees have approved of the placing of several important contracts for the provision of additional equipment at the Glasgow Harbour. Among these are tenders by Sir William Arrol and Company, Limited, for the supply of a 40-ton movable electric coaling crane at the South Quay of Prince's Dock at a cost of £17,843; by Messrs. George Russell and Company, Limited, for the provision of six 5-ton semi-portal electric cranes for Kingston Dock and Custom House Quay at a cost of £16,953; and by Messrs. Johnston and Phillips, Limited, for the installation of distribution cables, feeder pillars, switchgear, etc., for the electrical equipment at Shieldhall Dock No. 1 costing £12,956. The Trustees have also decided to provide for use in diving operations a self-propelling boat of 38-ft. in length and fitted with a 2-ton crane at an estimated cost of £900, in replacement of the present punt which requires the services of the tug or launch when being shifted from place to place.

Enlargements and Improvements to Commence at Inverness Harbour.

Inverness Harbour Trustees have decided to proceed with a scheme of enlarging and improving the harbour at an estimated cost of £25,000, and the Unemployment Grants Committee have agreed to pay 50 per cent. of the interest on approved expenditure on condition that a provisional order is obtained to authorise the work going on and the raising of the necessary loan. At a recently-held meeting of the Trustees it was estimated that the annual charge would amount to about £1,500, and the Harbour Engineer was instructed to prepare working plans in connection with the scheme.

Proposed Dock Extension at Bo'ness.

Bo'ness Dock Extension Committee recently had a meeting with the Scottish manager and officials of the London and North-Eastern Railway Company (owners of Bo'ness Dock) on the subject of dock extension. A new scheme has been launched by the committee under which it is proposed to construct a new harbour immediately to the east of the existing harbour, and thus provide an additional 5 berths for the loading and discharging of ships. The proposed site is a natural bay, the water in which stands 14-ft. above the level of the water at the dock sill to the east and it would thus be necessary to dredge deeply in order to provide the requisite depth for shipping. It would also be desirable to form a navigable channel through the Dodds Bank which runs parallel with the entrance of the existing dock and which bank at present constitutes a barrier to steamers of a large draught. The bay enclosed by quay walls would take the form of a new dock except that it would not be equipped with gates. In and around the site is a wide stretch of marshy land which may be acquired and reclaimed for the laying down of railway sidings. These would be connected with the main railway line between Bo'ness and Polmont, and would serve to relieve the congestion at the dock during the busy discharging season.

Dredging at Anstruther.

At a recent meeting of the Commissioners of Anstruther (Fifeshire) Union Harbour there was under consideration the question of dredging operations at the west basin, and—in connection therewith—it was reported that the Fishery Board had excavated 5,000 cubic yards of mud. That amount was half of the contracted area, and the Commissioners had now to consider how best to utilise the dredger for the remaining half. Previously it had been suggested that it should go on working along the side of the west pier so that it would make a deep channel wide enough to accommodate two drifters alongside each other. The harbourmaster pointed out, however, that when the winter herring season came on more than two drifters would be required to berth alongside each other, and he suggested that the best procedure would be to draw a line from the dredger's present berth at the west pier straight across to the middle pier; the whole area below that line to be dredged. Ultimately the Commissioners decided to communicate with the Fishery Board as to the advisability of having the entire harbour dredged.

Work for Unemployed at Aberdeen.

Important schemes of work—started, or about to be started—promise to provide much work for Aberdeen's unemployed population during the ensuing autumn and winter months. Aberdeen Harbour Authorities have not been lagging behind in providing work for the unemployed, and at the present time two projects are actually in hand, while a third (of greater magnitude) will be started soon. Commercial Quay on the north side of Albert Basin, is in process of being extended for a distance of about 300-ft. and this work is the continuation of the quay and fish market recently completed. Nine months will probably elapse before the scheme is completed, and when operations are in full swing about 50 men will be employed. Messrs. Clark and Chapman (Aberdeen) are the contractors. The other work is the construction of a grab hopper dredger the order for which has been placed with Messrs. Hall and Company (Aberdeen), and a beginning with this has been made. The big scheme with which a start will be made within a short time is the reconstruction of Albert Quay on the south side of Albert Basin. Tenders will be invited for the first section of about a thousand yards long, and thereafter the second section of eight hundred yards will be undertaken.

In addition to these schemes—which have been approved by the Unemployment Grants Committee—the Aberdeen Harbour Commissioners intend to proceed with several smaller works, the most important of which is the widening of the narrow portion of the fish market and wharf extending from Black's Lane to Market Street. The Commissioners will construct the wharfage and the Town Council will extend the fish market buildings, and the cost will be about £50,000. An early start will be made with this work, and it will be in progress during the lean winter months. The vast amount of materials required—steel, timber, cement and stone—will mean a brisker stream of business in other directions and more work all round. The Harbour Commissioners are certainly doing what they can (consistent with keeping the balance even on the financial side and retaining the harbour rates and dues as low as possible) to relieve unemployment locally.

Belfast Port Affairs.

Many Suggestive Figures.

THE official return issued by the Belfast Harbour Board of the imports and exports dealt with at the port during the half-year ending June of this year form an admirable barometer of industry in Ulster. One of the most noteworthy features of the return is the figures of the potato branch of the agriculture industry. From January to June, 1929, 26,394 tons were sent abroad and 50,997 tons across the channel, making a total of 77,391 tons. For the first six months of this year the figures were: 1,000 tons abroad and 19,466 tons to the other side of the Channel, a total of 20,466 tons, so that the decrease was a remarkable one.

Both the imports and exports of linen show a fall. Up to the end of June last 1,024 tons were imported, compared with 1,079 tons in the first six months of 1929, while the exports respectively were 16,211 tons and 17,465 tons, a drop of over 1,000 tons.

A substantial increase in the quantity of flax, the raw material of linen, is, however, shown. From January to June last 13,474 tons were landed, as against 8,782 tons for the same period last year. The exports for the comparitive periods were 716 tons and 708 tons. Flax seed imported totalled 1,630 tons, as against 1,594 tons in the first half of last year. The linen yarn brought ashore weighed 1,733 tons in 1930 and 2,457 tons in 1929. The tonnage of the last-named material exported was 2,147 and 2,355 for the respective periods.

Under the heading of " iron and steel " it is shown that 9,129 tons of borings were imported in 1930, compared with 7,370 in 1929. The respective iron and steel plate imports were 30,409 tons and 29,502 tons, while iron and steel wrought and bar, imports were 31,475 and 30,122 tons. Iron and steel scrap exported totalled 12,805 tons, compared with 14,095 tons during the first six months of last year.

The coal figures are all recorded on the import side, as not a ton was exported. No less than 652,549 tons were brought in, a drop of 30,000 tons, while the imports of coke rose from 4,329 to 6,053 tons.

New ropes exported totalled 852 tons, against 998 tons; the comparitive wine figures were 231 and 303 tons, and the new cordage exports dropped from 4,510 tons in the first half of 1929 to 3,585 tons this year.

There was not much change in the exports of eggs, the figures for the first six months of this year being 10,805 tons, compared with 10,954 tons last year. Butter imports are greatly in excess of the exports, the figures being: imports, 1930, 1,969 tons; 1929, 2,125 tons; exports, 1930, 195 tons; 1929, 158 tons.

More bacon was imported and less exported. For the first six months of 1930, 1,517 tons were landed, against 1,202 tons for the same period last year. The export figures respectively were 2,742 tons and 3,436 tons. Pork exports fell from 1,897 to 1,303 tons; the imports of cheese rose from 529 to 568 tons, while the exports fell from 12 to 9 tons.

The margarine exports were negligible, but the imports dropped to 1,805 from 1,843 tons.

The imports of manufactured and unmanufactured tobacco were 2,691 tons for the first six months of this year, compared with 1,404 tons for the same period in 1929, while the respective export figures were 1,778 and 1,545 tons.

Whisky imports were 398 tons for the first half of this year, against 365 tons; the exports were 1,495 tons, compared with 2,066 tons. Ale and beer imports were 1,719 tons, an increase of 2 tons.

Cattle exports increased from 42,181 to 52,512 head; lamb and sheep exports fell from 14,309 to 13,131, while 1,082 horses were sent across the channel, compared with 993 in the first half of 1929.

Amongst the other imports for the six months ending June of this year were: pedal bicycles, 6,068; motor bicycles, 246; bottles, 3,253 tons; cement, 22,012 tons; chemicals and drugs, 1,836 tons; cottons, 8,781 tons; flour, 32,426 tons; fish, preserved, dried and fresh, 2,549 tons; Indian corn, 111,505 tons; motor spirit, 30,320 tons; oil fuel, 20,099 tons; paraffin, 13,893 tons; and timber, 18,996 loads.

Traffic of the Port.

At a meeting of the Belfast Harbour Board on August 5th the harbour master (Captain McIntyre) presented a striking report of the traffic during the period beginning July 13th and ending on August 2nd; 486 vessels arrived, made up of 429 cross-Channel and coastwise, 36 foreign and 21 non-trading.

The tonnage of the vessels arriving at the port between January 1st and August 1st was: Cross-Channel and coastwise, 1,629,855; foreign, 396,891; non-trading, 77,952; total, 2,104,698. These figures showed, as compared with the corresponding period of 1929, an increase under the respective headings of 162,234, 38,175, and 27,819, or a grand total increase of 228,229 tons.

A Big Contract.

The Belfast Harbour Board has accepted the tender of Messrs. Charles Brand and Son, of Westminster, London, for the construction of the quays of the new dock and turning basin on the site of the timber ponds near Dufferin Dock, with the exception of the two quays which are being constructed by Messrs. Rank, Ltd., at their own expense in connection with their new flour mill.

The contract given to Messrs. Brand and Son will include an extension of the quay on the west side of the turning basin by 132-ft. This quay was originally designed for a length of 620-ft., but in order to meet the prospective requirements of the timber trade it will now be constructed to a total length of 752-ft.

The work of dredging the approach channel to the new dock from the Victoria Channel is being carried out by the Harbour Board's own plant and staff.

Messrs. Brand, it is interesting to recall, reconstructed the Donegall Quay in 1882 for the Harbour Board.

Launch of the Motor Vessel " Otaio."

The motor vessel " Otaio " was successfully launched from the naval construction works of Messrs. Vickers-Armstrong, Ltd., at Barrow-in-Furness, recently, but contrary to the usual custom, and at the special request of the owners, there was no launching ceremony.

The " Otaio " is a twin-screw Diesel driven vessel being constructed for the New Zealand Shipping Co., Ltd., under the supervision of Messrs. Esplen, Son and Swainston, Ltd., London, and to Lloyd's highest class.

The principal dimensions are as follows:—

Length between perpendiculars, 470-ft.; length overall, 490-ft.; breadth moulded, 67-ft.; depth, moulded to upper deck, 40-ft.; speed, 15¾ knots; deadweight (minimum), 12,300 tons.

The vessel is of the two-deck type, with a poop, long bridge and top-gallant forecastle, a part lower deck, a promenade deck, boat deck and navigating bridge. The Hull is of steel throughout, with eight watertight bulkheads dividing the vessel into six cargo holds, with the engines amidships. A double bottom is fitted throughout for the stowage of oil fuel, fresh water and water ballast, together with deep oil fuel tanks in the forward hold, amidships and in the wings abreast the shaft tunnels. Storage for approximately 2,300 tons of oil fuel is provided in this manner.

Five of the cargo holds and several of the 'tween deck spaces are being insulated for the carriage of refrigerated cargoes, each space having a large hatchway served by four 10-ton cargo derricks with the necessary winches. In addition a 50-ton derrick is being fitted for use at Nos. 2 and 3 hatchways for dealing with heavy lifts.

The officers and crew are all berthed amidships in well-furnished cabins, having separate messrooms and bathrooms for the various ratings. The galley, pantries, smoke rooms and store rooms are also arranged inside the amidship deckhouses, while a hospital furnished complete is fitted aft on the poop deck.

Electricity supplied by three Ruston and Hornsby Diesel generator sets of 300 k.w. each is used throughout for lighting and heating, while all the auxiliary and deck machinery is also electrically driven, and the vessel is fully equipped and fitted as a first-class cargo liner suitable for summer service in tropical climates and also for winter service in the North Atlantic.

The main propelling machinery consists of two Doxford opposed piston airless injection engines having four cylinders each with a diameter of 27½-in. and combined stroke of 82½-in., giving a total of 9,400 b.h.p. at 120 r.p.m.

The scavenge pumps and oil fuel pressure pumps are engine driven, and a Michell thrust block is combined with the bedplate of each engine.

Two Clarkson thimble tube boilers are fitted, fired either by exhaust gases or oil fuel. The working pressure is 100 lbs. per sq. in. and the steam is used for driving a Belliss and Morcom 125 k.w. generator.

Ribble Navigation.

Report by James Barron, M.Inst.C.E., Engineer and General Superintendent, at Inspection of River and Works, on Thursday, 24th July, 1930.

IN comparing the state of the river at the present time with its condition last year and in former years, it is customary to divide it into sections, the first from the dock entrance at Preston for 4 miles seaward, second from 4 to 8 miles, this 8-mile length being referred to as the upper reaches, and was selected because for many years sea low water level was found at the top end of a pool 8¼ miles from Preston. Third from 8 to 11 miles, which is the extent of the curved south wall opposite Lytham authorised in 1896, but not constructed until 1906, fourth from 11 to 14½ miles the present sea end of the training walls, and fifth, the untrained navigation over the bar beyond the training wall end to deep water.

Dealing with the sections in the order stated, at the inspection a year ago we had just passed through a record drought with no freshets to scour the river bed. In consequence, the level of the sand in the first mile near the dock entrance rose to as high as 6-ft. 6-in. for a few days until extra dredging reduced it, and so in the first 6 months of last year the average height of the highest place was 4-ft. 7-in. above sea low water. This year it is 2-ft. 9-in. on the average, ranging from 3-ft. 5-in. to 2-ft. 1-in. There was about the usual amount of fresh during the past winter and, beginning in November, 1929, for a continuous period of six months, the worst place in the navigation never exceeded 3-ft. 2-in. above zero and was as low as 1-ft. 10-in.

In 1925 the highest point in the bed of the river averaged 2-ft. 10-in., so that the 2-ft. 9-in. of this year is the greatest average depth yet attained in the first half of any year. Although the highest point, which is the ruling height for navigation, has been 2-ft. 9-in. above zero as stated, the general level of the sand in the first four miles has been at zero on the average during this six months.

In the second section, between 4 and 8 miles, the River Astland joins the Ribble at 5 miles below the dock, and, as the North Training Wall of the Ribble opposite the Astland mouth is much lower than that on the south side, the currents are not confined to the width of the channel for the whole tide, and so sand banks form above and below the confluence. Occasionally the sand at the mouth of the Astland is the highest part of the river, which is inconvenient for navigation and it is proposed to remedy this state of matters at a cost of £10,000 by bringing up a portion of the North Training Wall to the same height as the South one. The average level of sand in this section has been in the first six months of this year 14-in. below zero.

There is thus in the first 8 miles a deeper river both as to the shallowest place and the general level of the bed than we have had hitherto.

Deepening the upper reaches ceased in 1926, and since then nothing more than maintenance has been done. The three sand pumps which are at work are able to maintain the depth and even slightly improve on it.

All the maintenance dredging is done in the narrow upper reaches for about 5½ miles below the dock entrance, and no dredging is required anywhere else.

The section from 8 to 11 miles has no Training Wall on the Lytham side for a full mile of its length, although the Church Soar to some extent serves the same purpose. The water area in this length averages 266 acres, it amounted to 188½ acres in 1910, to 253½ in 1917, to 271½ in 1925, and 275 acres in 1930.

The average depth over these areas was 7-ft. 10-in. in 1917, 7-ft. in 1925, and 7-ft. 9-in. in 1930.

The fluctuations in depth in this length are probably due to the variations in the amount of sand removed by the winter freshets from the upper reaches and deposited in the upper end of this length. For instance, there was a marked deterioration after the flood of October, 1927, but which has now disappeared.

In the fourth section from the 11 to 14½ miles, that is to the end of the training walls, the area of water at low water and the depths have increased since last year, the contour of 12-ft. below zero by 26½ acres, and over 27-ft. deep below zero now shows nearly half an acre increase.

It is now 20 years since this section was first opened to navigation and it is surprising to find that its depth and capacity are still increasing under natural forces alone. It might have been expected to reach a maximum before now.

The area in this section between the walls is 573 acres, and in 1910 was made up of 380 acres of water and 193 acres of sand at low water. This water area gradually increased until 1917, when it reached 566 acres, thereafter diminishing until 1925, when it was only 437 acres in area, and has been increasing since then, as it is now nearly 500 acres. The average area of water over 16 years has been 503 acres.

The depth of this area has kept increasing all the time. In 1910 the 380 acres averaged 4-ft. 9-in. depth, in 1917 the average depth was 8-ft. 2-in., in 1925 it was 9-ft. 9-in., and in 1930 the depth was 10-ft. 5-in. over the whole water area of 499 acres.

The narrowest parts of the channel at low water are 750-ft. wide at 14½ miles, 700-ft. at 13½ miles, 680-ft. at 11 miles, and 575-ft. at 9⅞ miles, these widths being rather more at the sea end and rather less at the land end than they were a year ago, but in all cases ample for navigation.

The fifth section, the deep water course for vessels beyond the training walls, is in much the same direction as last year, that is in a westerly direction for about a mile and then slightly more northerly to Nelson Buoy. The deep water is still moving south and is south of the line of the intended South Wall. The width between low water contours at ¼ mile beyond the end of the walls is 1,000-ft.

The Bar is about 500-yds. in length between the 6-ft. contours and about 3-ft. 3-in. deep below low water in the shallowest place, being 3-in. more than last year.

The necessity for extending the walls from 14½ miles to 16 miles has been annually urged at these inspections since 1922, and it would almost appear that there is a real prospect of carrying out the work, as it is now proposed to ask powers from Parliament to carry out the work and borrow the money necessary to do so.

To take advantage of the deepened upper reaches a deeper bar is necessary, which can be obtained by extending the walls seaward.

For the larger size of steamers now frequenting the port it is too risky to leave the channel unconfined beyond the end of the training walls and free to wander at will. The extension of the walls will secure the direction of the channel and push the bar out into deeper water, which will be warmly welcomed by owners and masters of vessels and enhance the reputation of the port.

The cost is estimated at £100,000 for 1½ miles extension of both walls and to take seven years to complete.

Last year, out of 245 vessels arriving from abroad, 93 carried over 2,000 tons of cargo, whilst in 1914, out of 190 foreign cargoes arriving, only 28 exceeded 2,000 tons. We had 7 vessels last year with cargoes in excess of 4,000 tons and 1 vessel carried upwards of 5,000 tons.

Since last inspection the cattle lairage extension and the steam supply for pumping petrol have been completed, and another shed for storing redwood erected exhausting all the borrowing powers for the general purposes of the undertaking and £2,500 more which had to be taken out of the rates.

It is therefore necessary that power should be got in the proposed Bill to borrow money for equipment, to be spent as needed to meet the growth of trade, and a sum of £50,000 is suggested, estimated at £10,000 a year for a period of five years.

[The Report of Mr. Merriweather, General Traffic Manager of the Ribble Navigation, will appear in the October issue.—ED.].

Dundee and "Safety First" Arrangements.

While referring to Dundee it is worthy of mention that the highly satisfactory "safety first" arrangements at the local harbour are commented upon in very complimentary manner by the Chief Inspector of Factories and Workshops in his newly-issued annual report. The inspector states that the port at which the best safety work is found is Liverpool, and that in Scotland the most efficient committees are those established at Dundee and Ardrossan. There are still a number of important ports (including Southampton, Glasgow and Leith) at which little has been done. Mr. William Kinnear (chairman of the Dundee committee) stated that it was quite a pretty compliment they had been paid, and explained their activity. "The committee is thoroughly representative of various interests at the harbour," he said. "We meet once every month, and we are ever ready to hear suggestions which might further eliminate the risk of accident at the harbour. Hearty co-operation between employers, employed, and ourselves has been the secret of the success of the Dundee organisation. The work has been carried on since March of last year, and I think we have achieved a fair measure of success."

The Humber Ports.

Alarm at Humber Bridge Proposals.

A VERY serious question has arisen as to how far the proposed new road bridge across the Humber in the vicinity of Hull might affect the navigable channel of the river, and with it access to the docks at Hull and to the port of Goole, on the Ouse. The Humber Conservancy is the authority over the river, and the report of its engineering staff and advisors has yet to be framed. Its appearance will be awaited with the keenest interest for the preservative of a good navigable fairway is a matter of life and death to the Humber ports. In the meantime, however, the Chairman of the Conservancy (Mr. J. H. Fisher, J.P.), in some comments on the scheme the other day, expressed the opinion that there is a considerable danger when one comes to put into a river like the Humber big piers to carry a bridge, for everybody knew that even without obstructions of this sort there were plenty of alterations in the channel, and that it was most difficult to navigate. At Hull at the present time, and for many years past, Mr. Fisher went on, the channels had been pretty stable, but those above Hull were of the shifting type, and perhaps when the new training walls at the confluence of the Trent and Ouse were completed there would be a more stable channel. He wondered, however, whether the piers would affect the channel as regarded steamers going to Hull, but he admitted that he was not an expert on the matter. If there were any chance of the proposed bridge being a menace to Hull or of diverting the channel in any way, the proper authorities to take a lead in the matter would be the Hull Corporation, backed up by the Humber Conservancy Board and by other interested authorities, but unfortunately the Corporation were pledged up to the hilt in favour of the scheme. If the river experts condemned the situation of the bridge and so on, what would be the position of the Hull Corporation with regard to protecting the town and port of Hull, which should be their first consideration?

Sir John Eaglesome, K.C.M.G., managing director of the Aire and Calder Navigation, who entertained the members of the Conservancy Board and the Hull Trinity House, also said that he could not see why an obstruction in the form of the proposed bridge across the Humber should be added to those which already existed.

Sir John added that it was only through the courtesy of the officials at the Ministry of Transport that he obtained possession of the consulting engineer's report on the proposed bridge. Paragraph 31 of the report read:—" No large vessels ply on the estuary of the Humber above Hull docks, and none is ever likely to do so, as the expense necessary to dredge and maintain through the shallow upper reaches of the estuary a deep water channel to Goole would be so excessive that the prospect may be dismissed as outside the range of reasonable possibility." The difficulties of navigation in the upper Humber for sea-going vessels to and from the port of Goole were already sufficient without bringing in additional danger. Vessels could only navigate the upper part of the estuary during a period of three hours at each tide. There was often fog in addition to the smoke of Hull, and this prevented mariners from picking up the leading lights near Hessle. If there were a bridge across the Humber it would be most difficult with a strong flood stream to make the entrance to the channel. With a strong tide, which might be, and often was, deflected across the channel, a steamer could not make sure of effecting an entrance to the bridgeway. The stream did not run at right angles to the proposed position of the bridge and, therefore, with low visibility, a ship which failed to pick up the guiding lights on the bridge might possibly collide with a pier, become a wreck and block the channel.

The party, which numbered 30, travelled along some 13 miles of the Aire and Calder Navigation's system, including a section of the junction canal which connects the Knottingly and Goole Canal with the Sheffield and South Yorkshire Navigation. At Whitley Lock they saw the penning at one operation of a compartment tug and a train of 19 compartment boats containing 700 tons of coal from the West Riding for shipment, and later, at Goole, the shipment of the coal from these boats at a floating hoist. In a tour of the docks they inspected work in progress on the new large entrance lock at the south-east corner of the port and the diversion of the entrance to the Dutch river.

With reference to the proposed Humber bridge it may be stated that it is definitely known that the Ministry of Transport have promised to provide 75 per cent. of the estimated cost contingent upon all the local authorities contributing the balance. The Hull Corporation has fixed their contribution at £200,000 and other local bodies various sums. The East Riding County Council, however, have declined to vote anything, and at a conference held at Hull on August 13th it was indicated by their representatives that there was no possible hope of that body changing its decision. This has put the whole scheme in jeopardy, and another conference was called for September 1st. In the meantime the district councils will meet and decide on their contributions, and in this way it is hoped to fill the gap caused by the East Riding County Council's abstension.

Port of London Notes.

London's Shipping.

During the week ended August 8th, 974 vessels, representing 969,935 net register tons, used the Port of London; 608 vessels (812,579 net register tons) were to and from Colonial and foreign ports and 366 (157,356 net register tons) were engaged in coastwise traffic.

Seven vessels discharged meat cargoes during the week: five from Australia and New Zealand, the " Orvieto," " Port Campbell," " Port Curtis," " Mahana," " Tainui," and two from South America, the " Andalucia Star " and " El Argentino." Altogether some 166,880 carcases of lamb and mutton, nearly 88,000 quarters of beef, quantities of pork and rabbits, and 39,600 packages of sundries were distributed to the London market and throughout the country or placed in cold storage.

* * * *

During the week ended August 15th, 1,478 vessels, representing 1,124,404 net register tons, used the Port of London, constituting a record for any one week; 600 vessels (855,565 net register tons) were to and from Colonial and foreign ports and 878 (268,839 net register tons) were engaged in coastwise traffic. The 436 vessels, representing 647,061 net register tons, which used the Authority's docks during this period also shows a substantial increase over previous weeks.

One of the most interesting vessels to arrive was the new motor liner s.s. " Terukini Maru," 11,800 tons gross, which is the first of the two new passenger liners to be operated on the Japan Europe route by the Nippon Yusen Kaisha Line.

Nine vessels discharged meat cargoes during the week: seven from Australia and New Zealand, the " Naldera," " Turakina," " Cambridge," " Huntingdon, " Norfolk," " Ascanius " and " Moreton Bay," and two from South America, the " Tuscan Star " and " Highland Brigade." Altogether some 549,804 carcases of lamb and mutton, 74,353 quarters of beef, quantities of pork and rabbits, and over 27,000 packages of sundries were distributed to the London market and throughout the country or placed in cold storage.

During the week ended August 22nd, 952 vessels, representing 942,815 net register tons, used the Port of London; 576 vessels (792,632 net register tons) were to and from Colonial and foreign ports and 376 (150,183 net register tons) were engaged in coastwise traffic.

Six vessels discharged meat cargoes during the week; four from Australia and New Zealand, the " Port Darwin," " Tongariro," " Rangitane," " Barrabool," and two from South America, the " Norman Star " and " Upwey Grange." Altogether some 133,230 carcases of lamb and mutton, nearly 95,000 quarters of beef, quantities of pork and rabbits, and 31,600 packages of sundries were distributed to the London market and throughout the country or placed in cold storage.

* * * *

During the week ended August 29th, 1,033 vessels, representing 979,453 net register tons, used the Port of London. 561 vessels (792,734 net register tons) were to and from Colonial and foreign ports and 472 (186,719 net register tons) were engaged in coastwise traffic.

Six vessels discharged meat cargoes during the week; four from Australia, the " Mongolia," " Kent," " Karamea " and " Devon," and two from South America, the " Highland Hope " and " Avila Star." Altogether some 172,000 carcases of lamb and mutton, over 102,000 quarters of beef, quantities of pork and rabbits, and 17,000 packages of sundries were distributed to the London market and throughout the country or placed in cold storage.

First "White Star" Liner to use Tilbury Passenger Landing Stage.

Early one morning recently about 450 tourists disembarked at the Tilbury passenger landing stage from the s.s. " Calgaric." This is the first occasion that a White Star liner has used the new Port of London passenger facilities opened this year.

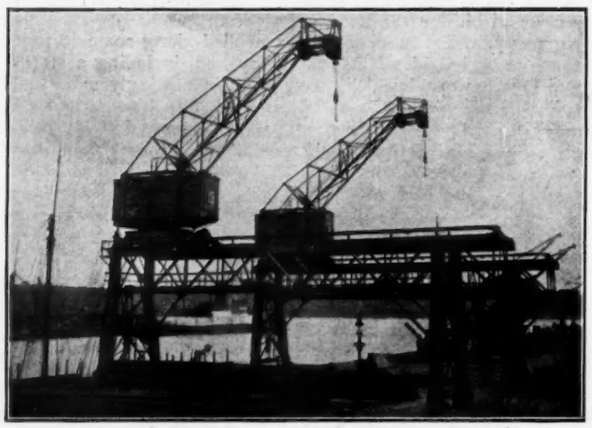
The " Calgaric " has just returned from a cruise to the northern capitals, and after landing her passengers the vessel proceeded into dock to load outward cargo.

The Port of Stockholm.

(Continued from page 331).

Pilot Service.

Outside the harbour area the pilot service is in charge of the State pilots with stations at Stockholm, Landsort, Huvudskär, Dalarö, Sandhamn, Furusund, Söderarm, Arholma, and Södertälje. The tariff has been fixed by the Government. Within the port the vessels are taken by the city harbour pilots to the anchorages or mooring places therein, as decided by the harbour master, and from these places to the boundaries of the harbour area. The harbour pilots are appointed by the Harbour Board, and their charges are regulated by a certain tariff, submitted by the Harbour Board to the City Council, and after approval by the Council confirmed by the Governor. A harbour pilot may be had on application to the Harbour Office, but the employment of a harbour pilot is not compulsory.



Five-tons Bridge Cranes on Southern Basin Quay at Vartahamnen.

Ice Conditions.

The waters surrounding Stockholm are generally ice-bound from December to March. By means of the two ice-breakers belonging to the city, Isbrytaren I. of 1,200 I.H.P., and Isbrytaren II. of 4,000 I.H.P., the port has, however, always been kept open to navigation hitherto.

The pack-ice at sea is sometimes very difficult to negotiate, but never blocks all approaches to Stockholm at the same time. Either the Sandhamn or the Landsort channel is therefore always open. There are no charges for ice-breaking in the port or its approaches.

Norra Blasieholmshamnen.

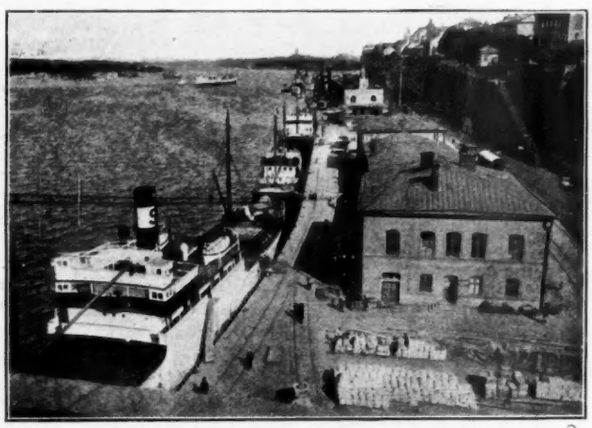
Shipyards, Drydocks and Repairing Shops.

There are in Stockholm or its immediate vicinity seven shipyards with slips and dry docks, as well as floating docks, viz., on the sea: Södra Varvet, on the eastern part of Stadsgarden, Finnboda Varv on the southern mainland along the principal fairway, and the royal naval shipyards, "Galärvervet," at Djurgarden, and Gustav V. dock, on Beckholmen; and on Lake Mälaren: Bergsunds Mekaniska Verkstad in the southwestern part of Södermalm, Löfholmsvarvet at Liljeholmen, the city shipyard on Langholmen ("Mälarvarvet"), and Ekensbergs Varv on the southern mainland just outside the harbour area.

Södra Varvet has a floating dock with a capacity of 350 tons, a length over the keel blocks of 31 m., a width of 9 m., and admits ships drawing up to 4.5 m.

Finnboda Varv has a slip with a length above the water of 106 m., a width of 11 m., and a depth at the outer end of 5.3 m., admitting vessels of 1,200 tons weight, and two floating docks, the bigger one with a capacity of 1,400 tons, a length over the keel blocks of 45.7 m., a free width of 13.4 m. and admitting ships drawing up to 5.3 m., and the smaller one with a capacity of 700 tons, a length over the keel blocks of 27.4 m., a free width of 13.7 m., admitting vessels drawing up to 3 m. When coupled together the two floating docks have a capacity of 2,100 tons, a length over the keel blocks of 73.5 m., a maximum depth in the fore part of 4.2 m. and in the after part of 5.3 m. The Finnboda Varv has leased two graving docks on Beckholmen from the State. The outer part of the western dock has a length of 52.15 m., a width at the gate of 10.76 m., and a minimum depth of 3.3 m. on the keel blocks. The inner part of the dock has a length of 44.2 m., a width at the gate of 11.9 m., and a depth on the keel blocks of 3.3 m. The eastern dock has a length of 100 m., a width at the gate of 16.56 m., and a depth of 4.2 m. on the keel blocks.

Galärvarvet has a slip with a length of 53 m. above the water, a distance between the tracks of 5.87 m., and a depth at the outer end of the truck of 2.5 m., admitting vessels not exceeding 110 tons, as well as a graving dock with a length of 127.1 m., a width at the gate of 17.8 m., and a depth of 6.97 m. on the sill at mean water.



Stadsgardshamnen, seen from the roof of the Warehouse Building.

Gustav V. dock on Beckholmen (a graving dock) has a length over the keel blocks of 140.2 m. (or possibly 152.2 m.), a width at the gate of 24.5 m. at mean water, and 22.58 m. on the sill, and a depth at mean water of 9.6 m. on the sill and 9.35 m. on the keel blocks.

Bergsunds varv has a slip for hauling vessels lengthwise, with a length of 70 m. above the water, and combined with it another slip for hauling vessels sideways, admitting ships of 42 m. in length. On the latter 3 to 4 ships can be accommodated. Ships weighing more than 350 tons cannot be accommodated.

Löfholmsvarvet has a slip with a length above the water of 22 m. for vessels of 100 gross tons, and a depth of 1.65 m., as well as a floating dock 28 m. in length (over the keel blocks 33 m.) with an inside width of 10 m., admitting vessels of 350 tons burden and drawing 2.7 m.

The city shipyard on Langholmen, "Malarvarvet," is maintained by the Harbour Board and has two slips with lengths above the water of 39 m. and 49 m. respectively, and accommodating vessels weighing 240 and 150 tons respectively.

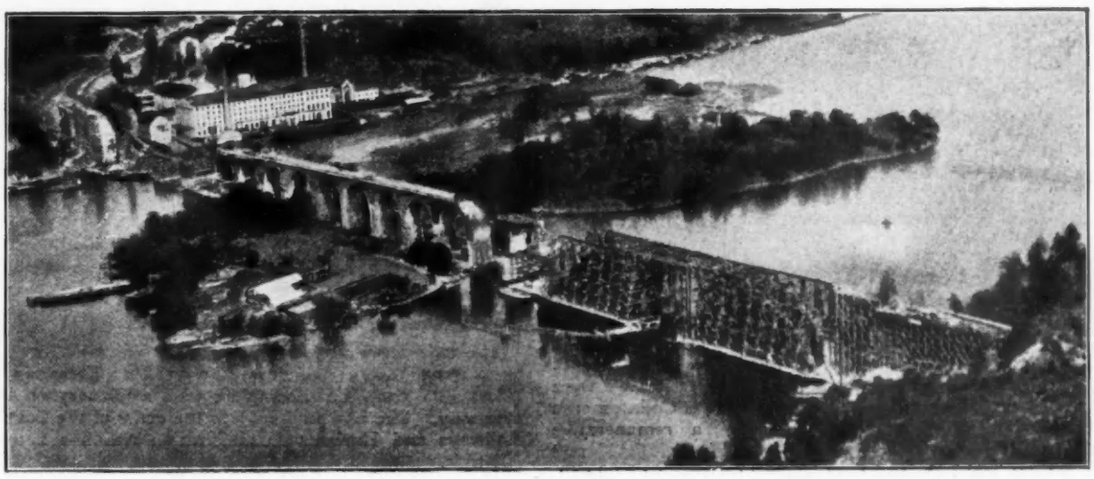
Ekensbergs Varv is equipped with three slips, one with a length above the water of 80 m., a depth on the truck of 4.5 m., and accommodating vessels of 1,200 tons weight; another with a length of 60 m. above the water, a depth on the truck of 1.5 m., and accommodating vessels of 300 tons weight, and a third 38 m. in length above the water, with a depth on the truck of 1.4 m., and accommodating vessels of 100 tons weight.

At all the above-mentioned shipyards, except the one on Beckholmen, there are also yards and shops for repairing work.

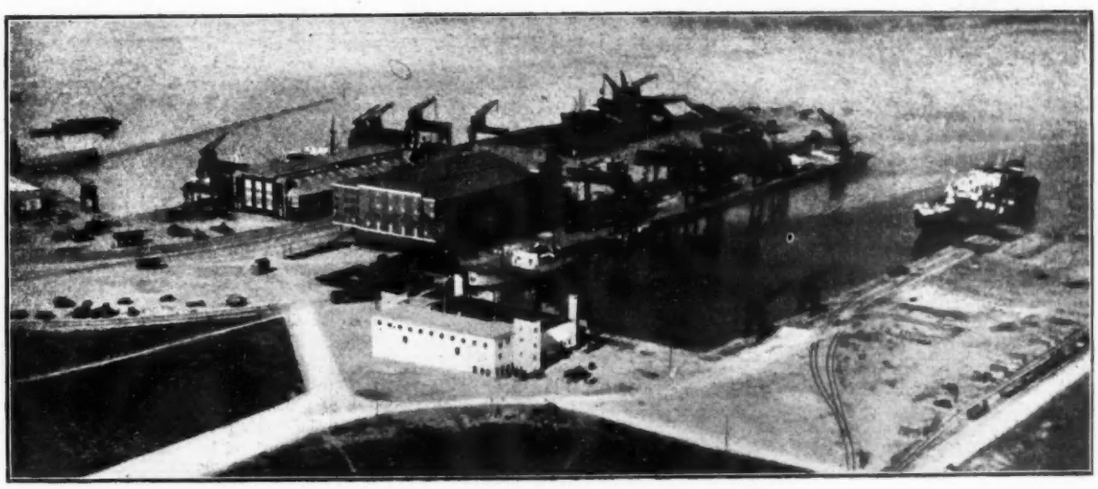
Within the harbour area there are, in addition, a number of repair shops adjacent to quays, such as Värtans Mekaniska Verkstad and Tegeluddens Mekaniska Verkstad at Värtahamnen, and Messrs. Julius Sjögren and Elektriska Svetsnings Aktiebolaget i Stockholm at Henriksdal.

(To be continued.)

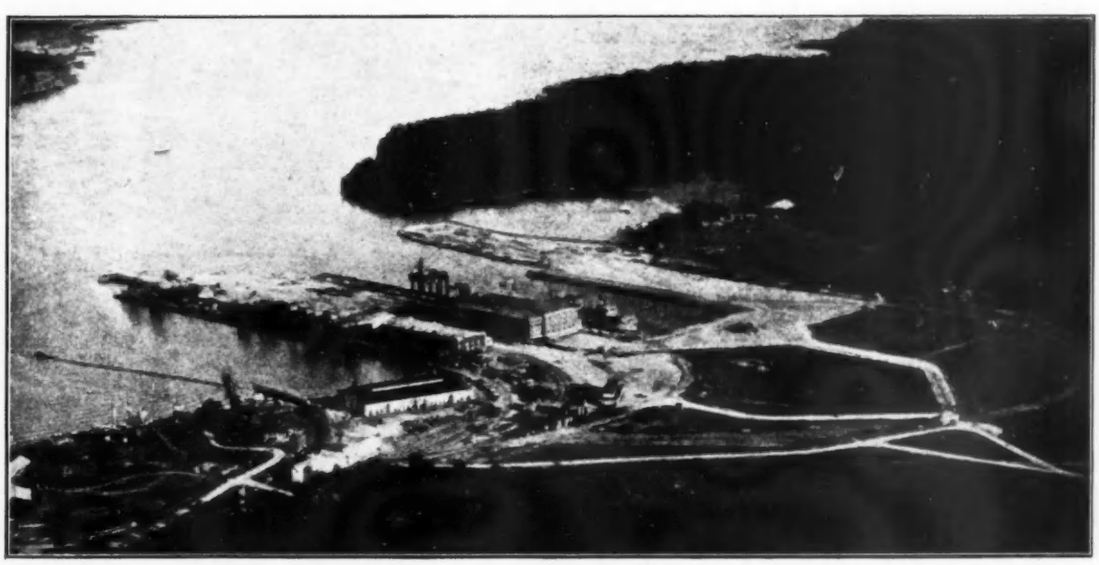
Port of Stockholm.



The Arsta Bridge over the Hammarby Canal, under Construction, seen from the West.



The Free Port.



The Free Port (in the foreground) and Lindarangsviken, with the Air Port.

Notes of the Month.

New Vessel for Dover Harbour Board.

An interesting craft which was recently designed, constructed and delivered by James Pollock Sons & Co., Ltd., to the order of the Dover Harbour Board is the steel towing hopper barge "D.H. 10."

The dimensions of this vessel, which is now in service, are: length B.P., 90-ft.; breadth mld. at deck, 22-ft.; depth mld., 8-ft. 6-in.

The "D.H. 10" has a pointed stem and stern, square chines. The hopper is situated amidships with six doors on each side and has a capacity of 225 tons to the top of the coamings at 22 cubic feet per ton. The doors are operated by four hand winches, situated two at each end of the well.

Successful Year for Dundee.

Dundee Harbour has had a very successful financial year as shown by a statement of accounts submitted to the Finance Committee of the Local Harbour Trust. For the year ended May 31st last the ordinary revenue amounted to £136,775 and the expenditure to £118,337—leaving a balance of £18,438. Among the items of extraordinary expenditure written off were £4,455 for Clan Shaw liability and £4,227 for the Colinton case expenses (legal). The Tay Ferries proved a remunerative undertaking during the year—the revenue being £25,427 and the expenditure £22,782—and thus leaving a surplus of £2,642. Among the items of authorised expenditure recommended are the re-roofing of four of the relief sheds at the eastern wharf at a cost of £1,200 and the construction of a new railway loop at a cost of £500.

Docks in Miniature.

Inland docks are springing into existence along the banks of the Grand Union Canal.

Messrs. Lyons have now at their Greenford factory an admirably equipped dock, and the H. J. Heinz Company have provided at their Harlesden works a loading and discharging wharf equipped with the most up-to-date plant. Both these firms receive coal supplies and other merchandise practically inside their works and despatch their products by canal to the Regent's Canal Dock, Limehouse, where they are transferred to steamers for distribution to British ports. The H. J. Heinz Company use the Grand Union Canal as the key waterway to link up with the other waterways of the country, and they carry on a transport service between Harlesden and big Midland cities and points as far distant as Hull.

"Private docks are increasing on the chief canals of this country," said an official of the Grand Union Canal Company recently, "and when our new development scheme, which is to cost about £881,000, is completed, much more accommodation will be available for such depots, as well as for factory sites and waterside wharves.

"The work of discharging and reloading barges is greatly facilitated by the provision of special accommodation and equipment, and the firms possessing these are among the most enterprising in the country."

Marconi Apparatus for Eleven Ships of a Fleet.

Eleven ships now being built for the Anglo-Saxon Petroleum Co., Ltd., will be equipped by the Marconi International Marine Communication Co., Ltd., with the newest valve transmitting and receiving apparatus.

The valve transmitters known as the Type M.C.13, have a power of 1½ kilowatts and operate on interrupted continuous waves over the waveband 600 to 800 metres which is allocated to mobile stations by the Washington Convention. Interrupted continuous wave transmission is of great utility in extending the range and selectivity of a transmitter, and at the same time reducing interference with other stations. It therefore increases the value of the wireless installation to a ship, because it can provide a more effective service.

The receiver, Type 352, installed with this type of transmitter is a two-valve instrument with the exceptionally wide wave-range of from 15 metres to 20,000 metres. As this instrument is entirely self-contained, it is an easy matter to change from one wavelength to another, and so to receive all the information required on a ship from the point of view of safety in navigation and of interest to the ship's personnel.

This wide waverange, extending as it does into the short wavelengths, gives a ship a world-wide range of reception and places at its disposal meteorological forecasts and information from widely separated centres. These can be compared on the ship and utilised to assist navigation. With a receiver of this type no ship need be out of range of the British Post Office station at Rugby, so that the owners can always rely on being able to convey instructions direct to the ship with the minimum loss of time.

An emergency set conforming to all Government requirements is also included in the installation.

Hamburg Port Improvements.

A Senate's bill was passed by the Hamburg Assembly authorising the expenditure of Rm. 7,400,000 (£370,000) on improvements to the quays leased by the State of Hamburg for 25 years to the Hamburg America Line and the Deutsche Levante Line. It is proposed to spend about 1¾ million marks on the work this year and to spread the balance over the next four years. The Assembly also sanctioned Rm. 650,000 for the construction of a new fish market hall at Cuxhaven.

The Future Port of Belgrade.

According to plans, the Port of Belgrade is to extend along 8 kilometres of river bank, of which 3 are on the Danube and 5 on the Save.

For a section of about 1 kilometre detailed plans already exist and the necessary material has been obtained on account of reparations.

Hopper Dredger Launched.

The twin-screw hopper dredger "Springbok" was launched on August 21st, 1930, from the yard of Ferguson Brothers (Port Glasgow), Ltd., complete with machinery on board and steam up. She has been built to the order of the South African Railways and Harbour Administration and has a capacity of 800 tons.

Comfortable accommodation is fitted for officers and crew and electric light is fitted throughout. The propelling machinery consists of two sets of triple expansion engines and two boilers 180 lbs. w.p. All auxiliaries are separate and independent. The hopper gear is steam driven.

There are special windlasses, forward and aft, for manipulating the moorings, the bow windlass having a special barrel for a 50-ton lift.

The vessel is expected to go on trial shortly. The naming ceremony was performed by Mrs. Fawcett, wife of W. W. Fawcett, M.I.N.A., M.I.M.E., Marine Superintending Engineer.

Kiel Canal Traffic in July 1930.

A report received by the Department of Overseas Trade from the Acting British Consul-General at Hamburg states that the traffic passing through the Kiel Canal during the month of July compared with the previous month was as follows:—July, 5,460 vessels of 2,351,207 net register tons; June, 4,861 vessels of 2,240,072 net register tons.

Of the 5,450 vessels, 2,527 with an aggregate tonnage of 2,139,222 net register tons were registered sea-going steamers. These included: 2,418 freight and passenger vessels of 2,134,136 net register tons, 103 steam tugs of 4,433 n.r.t., and 6 fishing steamers of 653 n.r.t.

Further, 2,280 sailing vessels of 119,376 net register tons, 150 lighters and barges of 54,516 net register tons, and 493 pleasure and Government vessels of 38,093 net register tons.

The vessels were loaded as follows:—72 with passengers, 29 with cattle, 194 with coal, 99 with stone, 69 with iron, 649 with timber, 686 with grain, 57 with ore, 768 with other bulk goods, 942 with general cargo, 94 with miscellaneous cargo, and 1,791 empty or in ballast.

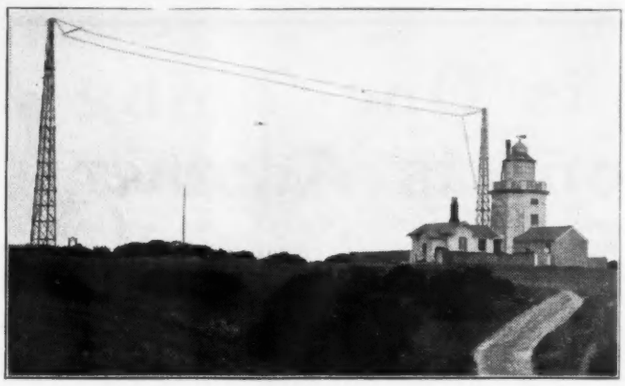
Personal enquiries regarding shipping and transport matters should be made at the City Office of the Department (Shipping and Transport Section), 73, Basinghall Street, London, E.C.2.

Obituary.

It is with deep regret that we learn of the death of Mr. G. G. Sim, C.S.I., C.I.E., Deputy-Chairman of Vickers Limited and Vickers-Armstrongs Limited, who passed away on August 19th in the Winchester House Nursing Home, Elgin, Scotland, after a very short illness, with pneumonia complicated by malaria.

Mr. Sim, before becoming associated with Vickers Limited, was attached to the Indian Civil Service. He was transferred to the Central Government in 1920, and his name will always be associated with two measures of outstanding importance in the financial history of India. Entrusted with the responsible and onerous task of consolidating and improving the Indian income-tax law and its subsequent administration, Mr. Sim afterwards rendered no less valuable service as Financial Commissioner to the Railway Department. In the latter capacity Mr. Sim played a prominent part in the separation of railway from general finance, a reform which was characterised by the Finance Member as the greatest financial achievement of recent years.

Mr. Sim joined Vickers Limited on the 1st July, 1926, and was appointed Secretary on the 15th July, 1926, subsequently becoming a Director of Vickers Limited and Vickers-Armstrongs Limited, and of several of the Associated Companies. On the 11th March, 1929, he was appointed Deputy-Chairman of Vickers-Armstrongs Limited and on the 6th November, 1929, Deputy-Chairman of Vickers Limited.



Cromer Lighthouse, fitted with Marconi Automatic Beacon Transmitter.

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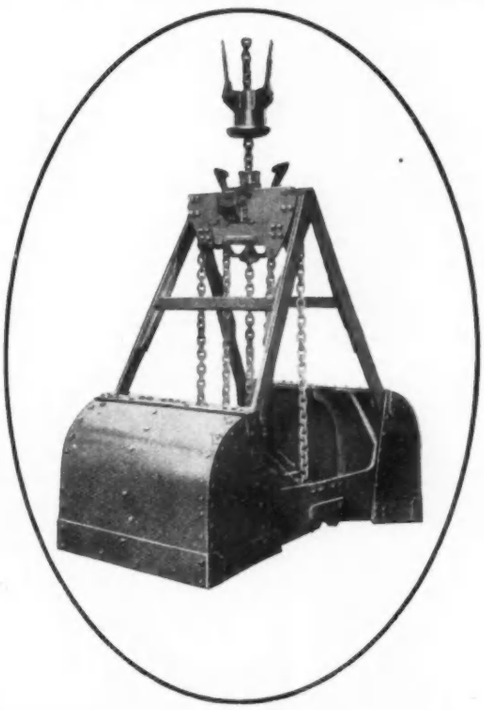

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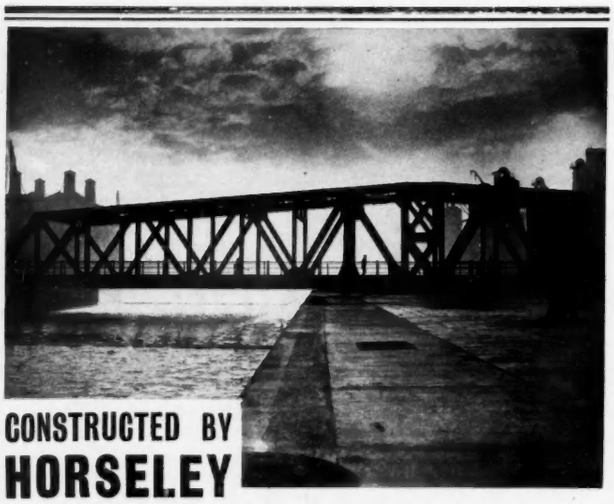

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North-East Coast Notes.

Blyth Harbour Commission.

A MOST interesting and informative report has been made by a deputation of members of Blyth Harbour Commission, which visited Danzig and Gdynia for the purpose of inspecting the equipment of these ports and learning something of the methods adopted which have enabled them to develop their coal exports to such an extent in so short a time. The report is prefaced by some figures showing the exports of coal by sea from Blyth, Great Britain and Poland to Scandinavia and the Baltic countries for the years 1913, 1925, 1926, 1927, 1928, and 1929.

	BLYTH.	GREAT BRITAIN.	POLAND.
1913	2,401,300	15,894,095	Nil.
1925	1,542,917	8,098,395	673,991
1926	588,230	2,735,326	3,925,875
1927	1,236,466	6,634,432	4,732,696
1928	649,377	4,879,401	6,021,642
1929	800,547	6,641,195	6,029,514
1930	598,356	5,179,188	7,578,000

The figures for 1930 are an estimate based on four months' shipments; 1926 was, of course, the year of the national strike of miners in the English coalfields.

The deputation first visited Danzig, being received there by Mr. Nagorski, the General Director, and Mr. Bruns, the Technical Director of the harbour, on Wednesday, June 18th; other members of the Board were present. The whole harbour was surveyed. In the new coal basin coal was being loaded and iron ore discharged. Some modern belt conveyors have been installed, the coal being discharged into a concrete hopper holding about 80 tons, from which it was lifted by a system of three conveyors and delivered into the ship at any point desired without the necessity of removing the ship. The coal appliances were not working at the time of the visit owing to lack of coal, but the deputation were given to understand that shippers complained that the conveyors caused a considerable amount of breakage, due, perhaps, to the method of tipping into a receiving hopper, and that for large coal they preferred the old system of grabs. The conveyor is capable of shipping at the rate of 400 to 500 tons per hour. The method of loading by grab appears to be very suitable for the hard Silesian coal. Breakage seemed to be negligible, either when picking coal from the waggons or when dropping it into the ship. There is, however, considerable damage done to the waggons, some spillage of coal, and the rate of shipment is very slow. One hundred tons per hour was mentioned for the 5-ton grab, but this would be a maximum figure. The export of coal from Danzig at the present time amounts to 5½ million tons a year, and there would be no difficulty in preparing facilities for a much larger export if the coal were available.

Visit to the Port of Gdynia.

The deputation visited this port on Friday, June 20th. They were met at the frontier by the harbour master and a representative of the new town of Gdynia. At this port most of the loading is done by grab, with the exception of one large transporter appliance belonging to the Robur Coal Shipping Organisation, which lifts the trucks bodily from the rails and tips the coals through the end door directly into the ship's hold. There was an interesting anti-coal breaking appliance in connection with this consisting of a hopper resting upon the hatch combings with a mechanically operated telescopic tube extending to the bottom of the ship's hold, and the deputation submit that something on these lines might be taken into serious consideration in connection with the shipment of coal at Blyth.

The deputation were impressed by the care which was being taken to ship the coal with the least possible breakage, and by the large amount of money which had been spent to attain this object, as well as to improve the rate of shipment. The coal is carried to the port in 15, 20 or 30-ton waggons, and in train-loads of 1,000 tons of coal. It has to come a distance of between 380 and 400 miles, and takes four to five days. It was stated there were no undue delays upon the railways, and attention was drawn to the new line which had been constructed entirely in Polish territory to feed the port of Gdynia. The coal is supplied in different grades and is worked down from the reception sidings to the shipping point by pilot engines. The coal exports for 1929 amounted to 2,369,000 tons, and in 1930, at the present rate of shipment, the export would be 3,500,000 tons, and the accommodation is being extended so as to be capable of shipping at least 8,000,000 tons per annum. It is obvious that everybody concerned was taking the greatest interest and pride in the work and development of the port, which is intended to be the national port of the country.

Deputation's Conclusions.

The point that created the greatest impression upon the members on their visit to these two ports was that either of them could be developed to deal with a very large volume of traffic, probably more than will be available for many years to come. From the point of view of shipment of coal, the deputation were struck by the care that was being taken at both ports to prevent breakage. The methods of shipment are entirely different from those at Blyth, so much so that it is difficult to make any real comparison. There is no doubt that the Silesian coal is much harder than Northumberland coal, and it is, therefore, necessary to take even greater care in the shipment if our coal is to arrive at its destination in a condition to compete satisfactorily. With one exception (the telescopic anti-coal breaker mentioned above) the members of the deputation saw nothing that could be used at Blyth with advantage. In these two harbours the waggons are brought alongside the ship upon the quay level, not upon high level staiths as at Blyth, which gives them an advantage in saving breakage, but not in speed of shipment. Having completed their visit to Danzig and Gdynia, the chairman and four members made a visit to the Polish coalfields.

An Object Lesson at Blyth.

In spite of very inclement weather, the annual survey of Blyth Harbour by the Commissioners on July 22nd was a very pleasant affair. There was a good attendance of Commissioners, and many representative persons in the coal and shipping industry, including two interesting personalities from India—Mr. Amrit Lal Ojha, the Indian employer's delegate to the recent Geneva Conference, and Mr. D. D. Thacker, of Jharia coalfields. Mr. Ridley Warham, chairman of the Commission, in welcoming the guests, said they had little shipping to show them on this occasion, but in the past the harbour had been teeming with shipping. " If anyone wanted an object lesson regarding the misery of Government interference with industry," said Mr. Warham, " they will see it in Blyth. Last year was busy and prospects were bright, but just at the time when we were about to make contracts for this year the Government introduced their miserable Coal Mines Bill and froze up all our buyers. They declined to buy from us, and to-day they are buying Polish coal at 11s. or even less—I have heard of a sale at 10s. per ton. You can imagine, therefore, what we are up against. We cannot produce at that figure, and no more can they, but in the meantime you see what dreadful competition exists in Europe."

About Tyne Trade.

At the last meeting of the Tyne Improvement Commission it was reported that in June the shipments of coal and coke totalled 1,254,133 tons, compared with 1,638,314 tons in June last year, a decrease of 384,181 tons, or 23.45 per cent. From January 1st to June 30th the loadings were 8,846,018 tons, as against 9,493,638 tons in the corresponding period last year, a decrease of 647,620 tons, or nearly 7 per cent. Idle tonnage in the river is still very heavy; at the end of June there were 89 vessels of 147,415 total net register tons laid up, compared with 87 vessels and 151,659 tons at the end of May and 32 vessels of 43,784 tons a year ago.

Mr. H. P. Everett said June was a bad month for all exporting districts. The total decrease for the North-East Coast ports in June compared with last year amounted to 600,000 tons. A pleasing feature, however, was that general merchandise, both exports and imports, showed a substantial increase over last year. The revenue for May and June was down £19,000, but £8,000 was due to reductions in charges.

Colonel Taylor pointed out that in January the price of coal exported from the Humber ports exceeded by 1s. 3d. per ton that from North-East Coast ports. In March the Humber price was higher by 6d. per ton, but in May the Humber price was 4d. per ton less than the North-East Coast price. This was an answer to those who spoke of the " cut throat " competition of the North-East Coast ports.

Mr. R. S. Dalgliesh, referring to the increase of the general merchandise of the river, said it had been greatly helped by the arrivals between May 30th and June 10th of 20 steamers with 31,000 loads of timber, which were the means of giving a good deal of employment.

North-East Coast Notes—continued.

Progress at Sunderland.

A further and important step was taken by the Sunderland Town Council at the end of July, when the scheme for the construction of a deep-water quay at a cost of about £350,000 was finally approved. It is to be made at the south side of the river, and will be 1,500-ft. in length. Only a week before this the joint committee of Sunderland Corporation and the River Wear Commission had decided to recommend the Town Council to proceed with the scheme, and this was the sequel to a visit of a deputation to the Government to see what help would be forthcoming if the work were undertaken. Although no definite grant was promised, it is understood that generous assistance will be given.

While dealing with the Wear it may be appropriate to mention another instance of smart work there. The S. S. Horden arrived in the South Dock, Sunderland, at 7.15 on Saturday morning, July 19th, commenced to load at 7.45 a.m., and finished at 4.20 p.m., having taken 3,850 tons of cargo and bunkers in 8 hours 35 minutes, this being at the rate of 450 tons per hour.

Personalia.

Mr. Harris Reid has been appointed secretary to Smith's Dock Co., North Shields, in succession to the late Mr. Henry Darling. Mr. Reid has been with the firm 45 years.

Mr. Henry Darling, who died in July last, had been connected with the ship repairing industry for 54 years, having joined the firm of Messrs. H. S. Edwards and Sons, South Shields, in 1876, and on the amalgamation of that firm with Smith's Dock Co. he was appointed joint secretary.

* * * *

Mr. Louis Zollner, the Danish and Icelandic Vice-Consul in Newcastle, has been made the recipient of the Norwegian Order of St. Olaf, which was handed over by Mr. Ch. Morgenstierne.

* * * *

Mr. William Scott Merryweather, a former well-known West Hartlepool shipowner, has just died. The family were among the pioneers of the shipping trade at Hartlepool, beginning with sailing ships. He joined his father as shipowner in 1878 and gradually developed the business.

Aden Port Trust.

The returns for the month of June, 1930, of shipping using the port are as follows:—

	No.	Tonnage.
Merchant vessels over 200 tons	123	499,722
Merchant vessels under 200 tons	18	2,689
Government vessels	10	26,487
Dhows	86	2,383
PERIM.		
Merchant vessels over 200 tons	23	79,627

The number of merchant vessels over 200 tons that used the port in June, 1930, was 123 as compared with 121 in the corresponding month last year, and the total tonnage was 500,000 as compared with 490,000.

Excluding coal, salt, fuel oil and military and naval stores and transhipment cargo, the total tonnage of imports in the month was 8,000 and of exports 4,500 as compared with 7,000 and 6,200 respectively for the corresponding month last year.

The total value of imports, excluding Government stores, was Rs. 45,23,000 as compared with Rs. 57,57,000 for June, 1929, and of exports Rs. 32,83,000 as compared with Rs. 51,35,000.

The total value of both imports and exports together was Rs. 78,06,000 as compared with Rs. 108,92,000 for the corresponding month last year.

Imports during the month were above those for June, 1929, in the case of coffee, grain, pulse and flour, hardware, hides (raw), seeds, skins (raw), sugar, tobacco (unmanufactured and manufactured), and treasure private; and below in the case of gums and resins, piece goods (grey, white and printed or dyed), and twist and yarn.

Exports were above those for June, 1929, in the case of hardware, hides (raw), sugar, piece goods (white and printed or dyed), and treasure private; and below in the case of coffee, grain, pulse and flour, gums and resins, seeds, skins (raw), piece goods (grey), twist and yarn, tobacco (unmanufactured and manufactured).

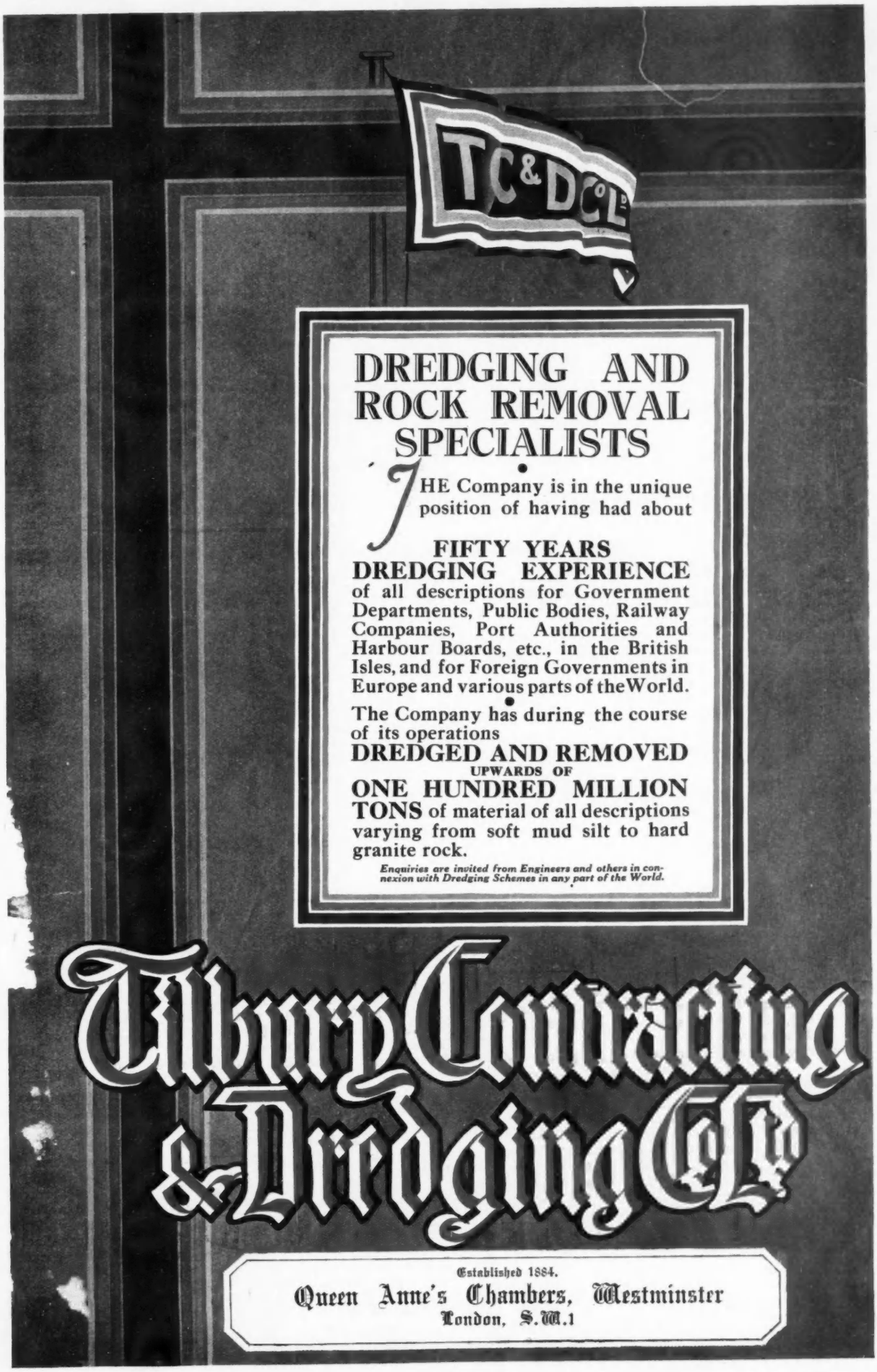
TRADE OF THE PORT.

Article.	Unit.	Imports.		Exports.	
		Quantity.	Value Rs.	Quantity.	Value Rs.
Coal	Tons	6,052	1,44,449	0	0
Coffee	Cwts.	7,305	2,71,253	4,986	2,74,750
Grain, Pulse and Flour	,,	46,756	3,38,790	26,951	2,06,935
Gums and Resins	,,	1,992	42,676	2,767	72,968
Hardware	—	0	20,650	0	16,939
Hides, raw	No.	3,630	8,037	8,887	20,300
Oil, Fuel	Tons	23,404	7,02,120	0	0
,, Kerosene	Gls.	89,616	65,920	7,376	5,672
,, Petrol	,,	8,000	10,375	1,672	2,230
Salt	Tons	0	0	7,650	65,000
Seeds	Cwts.	4,809	56,318	389	5,024
Skins, raw	No.	276,570	1,97,965	429,720	5,14,731
Sugar	Cwts.	22,311	1,68,113	12,358	97,287
Textiles—					
Piece Goods, Grey	Yds.	2,571,005	4,85,139	2,920,670	5,66,526
,, ,, White	,,	399,335	1,04,078	495,842	75,330
,, ,, Printed or Dyed ..	,,	615,770	1,72,943	556,825	1,84,239
Twist and Yarn	Lbs.	207,322	1,55,090	254,852	1,97,520
Tobacco, Unmanufactured	,,	323,764	97,697	585,536	1,57,196
,, Manufactured	,,	31,956	35,509	39,240	45,683
Other Articles	No. of Pkges.	41,184	9,01,748	13,240	3,93,810
Treasure, Private	—	0	5,44,079	0	3,81,120
Total ...	—	—	45,22,949	—	32,83,260

The Regulation of the Upper Elbe.

In response to their representations, the Association of Elbe shipping interests (Arbeitsgemeinschaft der Elbe-schiffahrt) has received a reply from the Reich Minister of Transport to the effect that he considers the regulation of the low water level on the Elbe from the Czechoslovakian frontier to Hamburg to be his next big task. Preliminary investigations of the problem have been made in the past for the purpose of a Parliamentary Bill, and, using this draft as a basis, a new and up-to-date scheme is in course of preparation which it is hoped to complete by the end of 1930. The amended scheme will then be examined and considered during the ensuing year.

Regret is expressed by the various Elbe interests concerned at the delay likely to result from this theoretical work, and it is urged that the preliminary investigations should be expedited to enable practical results to be achieved as quickly as possible.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The Port of New York.

Latest Data issued by the Bureau of Commerce.

Value of Foreign Commerce at Port of New York.

FOREIGN trade values at the Port of New York are still under those of a year ago. The total for May, 1930, of $265,652,000 was 17 per cent. less than the corresponding month last year. The Port of New York compares favourably with the rest of the country, however, in having a trade only 17 per cent. less than last year as compared to a 23 per cent. slump for the United States as a whole.

Exports for May, 1930, were $130,629,000 as against $132,649,000, only a slight decrease. Imports were $135,023,000 as compared with $188,511,000 in May, 1929. This drop of 28 per cent. in value reflects primarily the decline in unit prices of many of the more important commodities, such as coffee. The physical volume is believed to have declined much less than the aggregate value.

Exports of Automotive Products.

As shipments of automotive products constitute a large part of the export trade out of New York, it is interesting to learn some of the details of this traffic. An analysis of these exports during the month of February, amounting to $19,438,447, shows that 18 per cent. were trucks and buses, 49 per cent. passenger cars, 15 per cent. assembly parts, 15 per cent. replacement parts, and 3 per cent. accessories. During the month in question New York handled 62 per cent. of the automotive exports of the country.

The geographical distribution by destination were as follows:—

	Value (Dollars).	Per Cent.
Europe	9,688,212	50
South America	3,670,923	19
Asia	1,889,826	10
Oceania	1,747,977	9
Africa	1,484,945	7
West Indies	609,920	3
North America	346,644	2
	19,438,447	100

Automotive exports to European countries consisted of trucks and buses, 12 per cent.; passenger cars, 50 per cent.; assembly parts, 22 per cent.; replacement parts, 13 per cent.; and accessories, 3 per cent. The United Kingdom headed the list of European countries with $1,747,994, of which 38 per cent. was for passenger cars and 32 per cent. for assembly parts. Belgium ranked next to the United Kingdom with $1,475,077, of which 71 per cent. was for passenger cars.

Argentine received automotive products from New York to the value of $2,075,582, being the largest amount exported to any one country during the month. Exports to Argentine consisted of trucks and buses, 13 per cent.; passenger cars, 57 per cent.; assembly parts, 13 per cent.; replacement parts, 14 per cent.; and accessories, 3 per cent. Of the passenger cars, 47 per cent. were valued up to $1,000 each, and 53 per cent. over $1,000 each.

Grain Exports.

Exports of grain, both domestic and Canadian, at the Port of New York during May amounted to 4,562,000 bushels as compared with 5,299,000 bushels for the same month in 1929, a decline of 14 per cent.

Domestic grain declined 24 per cent., dropping from 359,000 bushels in May, 1929, to 274,000 bushels for May, 1930. This was due mainly to a decline in exports of barley, from 176,259 bushels to 344 bushels in the two periods. Exports of domestic wheat, however, increased from 155,569 bushels in May, 1929, to 258,431 bushels in May, 1930.

The decline in Canadian grain in transit was 13 per cent., having been 4,940,000 bushels in May of last year as against 4,288,000 bushels this year, due to lesser shipments of barley, oats and rye.

	May			
	1930 (Bushels)	1929 (Bushels)	Net Change Amount	Per cent.
Through the Port of New York.				
Domestic and Canadian Grain	4,562,000	5,299,000	—737,000	—13.9
Domestic Grain	274,000	359,000	—85,000	—23.7
Canadian Grain	4,288,000	4,910,000	—652,000	—13.2

An element of uncertainty in handling Canadian grain in bond through the Port of New York has been removed by a new administrative section in the tariff law which went into effect June 17th. Section 491 provides that a period of one year may elapse after the date of arrival at port of exit before any merchandise entered for transportation in bond through the United States shall be considered abandoned. This provides an adequate time for the holding of Canadian grain under carrier bond in the port and removes the anxiety manifested by the grain trade and carriers as a result of a ruling by the Commissioner of Customs in November, 1929, that all Canadian grain in bond for export under transportation and exportation entires could remain no longer than 90 days.

At that time the Port Authority, with the co-operation of representatives of the railroads, steamships and grain interests, made strong representation to the Secretary of the Treasury against the 90 day ruling, pointing out how the revenues of American railroads and steamships would be impaired and the commercial and physical organisation for handling export grain dissipated if the ruling went into effect.

Commerce at Port Newark.

During the month of June, 1930, 30,927,000 board feet of lumber and 5,460 tons of general merchandise were discharged from vessels at Port Newark. This commerce was delivered in 31 steamers, lighters and barges.

Steamship Passengers Travel via Port of New York.

Those steamship lines operating from this port in foreign service did not carry quite so many passengers in May, 1930, as in the same month last year. However, the total number for the first five months is about 5 per cent. ahead of the same period last year.

During May there were 43,950 arrivals and 35,706 departures, making a total of 79,656 in both directions, while a year ago there were 47,044 arrivals and 37,506 departures, which totalled 84,550.

Up to the end of May 347,535 passengers were carried in and out of this port since the first of the year, which compares with 331,727 carried during the first five months of last year.

Vessel Movements in Foreign Trade.

The net tonnage of vessels entering and clearing at the Port of New York during June was greater than a year ago, though the number was less:—

	June 1930		June 1929	
	Number of Vessels	Vessel Tonnage	Number of Vessels	Vessel Tonnage
Entrances ...	585	2,722,344	588	2,559,901
Clearances ...	560	2,598,236	601	2,627,392

New York State Barge Canal.

Traffic moving on the State Barge Canal during the 1930 season passed the million tons mark on June 21st with the tonnage total of 1,030,134. This is three weeks ahead of the million ton mark of last year and reflects an increase of 290,858 tons over the same period of 1929.

New Harbour Improvements.

The Erie Railroad has awarded the contract for the construction of a pier at its Jersey City terminal. This pier will be immediately south of new Pier 9, now being used by the Dollar Line. It will be 1,050-ft. long and 70-ft. wide, and will contain two storeys. It will be equipped with two railroad tracks and five heavy-duty elevators.

The harbour fleet has been increased by the addition of a new 360 h.p. self-propelled Diesel-engined lighter, "Dayton."

The Meseck Towing Company has added the steam tug, "Frederick E. Meseck," to its fleet. This is the second of four new tugs recently ordered by this company.

The large commercial dry-docking facilities at the Port of New York, provided by the completion of the Robbins Dry Dock of the Todd Ship Yards Corporation on December 7th, 1929, demonstrated their usefulness. The United States liner, "George Washington," which has previously been dry-docked in the Boston Navy Yard, is now undergoing repairs at the Port of New York. This ship is 23,788 tons and 722-ft. long.

Channel Improvements.

The Bureau of Commerce has prepared a map showing the projects and surveys authorised by the Rivers and Harbours Bill recently signed by the President. Copies will be sent to interested parties upon request.